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The Bristol Medico-Chirurgical Journal

" Scire est nescire, nisi id me
Scire alius sciret."

SPRING, 1930.

THE DUTY OF MEDICINE TO THE RACE.

The Presidential Address, delivered on 9th October, 1929, at the opening of the Fifty-seventh Session of the Bristol Medico-Chirurgical Society.

BY

C. FERRIER WALTERS, F.R.C.S.,
Senior Surgeon, Royal Infirmary, Bristol.

I MUST first express my great appreciation of the honour the Society has done me in exalting me to this Chair, inadequately as I can but hope to fill it, in view of those illustrious ones who have preceded me.

As the subject of my address I propose to consider the question of " The Duty of Medicine to the Race."

Man, we have been long assured, has arisen from a simian ancestor, though of late the *tarsius*, that little exophthalmotic creature, has been invoked as his forerunner. If there be any who doubt this they can but admit that *Pithecanthropus erectus*, Piltdown, Rhodesian, Heidelberg and Neanderthal man, unlovely objects as they are depicted, were certainly of his forebears; while in Cromagnon man of 25,000 years ago—and who knows how much more ?—lived a race they might well be proud of as ancestors. He was

not only the equal of present-day man, but certainly surpassed him physically and, if cranial content counts for anything, was his equal if not his superior mentally, certainly his equal in artistic ability, and but that he lacked the accumulated powers, the result of scientific advance, might have outstripped him at the present day.

Whether we assume the Cromagnon as the source of civilization, spreading from the not too fabulous island of Atlantis to Egypt and South America, or prefer the sudden predynastic appearance of civilization in Egypt from an unknown source—though according to Woolley it was from the Indus through the Sumerians that it arose—is of little import compared with the development of civilization, no matter whence it came. Suffice that through the community, the tribe, the city and the state came the great civilizations, some eight or nine in all that we know, rising and falling through a definite period of years, culminating in our own western civilization, foredoomed also to fall, unless we learn from the past and correctly apply our modern scientific knowledge to prevent its decline.

Those past "cycles of civilization" — those "parabolas of peoples"—were ephemeral things, here to-day and gone to-morrow. The 1,800 years of their cycle is as a moment. Gone are the civilizations of Sumer, Egypt, Greece, Crete, Rome, Arabia and Spain. Zimmern likens modern man to the Greeks in mental attainments, as the negro to ourselves at the present day. Is man, therefore, likely to make western civilization any more permanent than those past until and unless he be master of his fate? We have some evidence of the cause of this decline and fall of races. Certainly in those past perpetual warfare must have been a factor, with its destruction of the fit and survival of the unfit; a reversal of natural selection.

Greece fell with the decay of marriage and family life, with the psychological infertility of its best stock, with exile and colonization, both in relatively large numbers, with the encouragement of pederasty, above all with the almost perpetual warfare of Greek against Greek, and finally their exportation by their Roman conquerors. All these things tended to eliminate the good stock. Was it a matter for surprise that the collapse of Greece was so sudden and complete ?

Despite the fact that Rome drew fresh blood from many sources, a similar degeneration of the people occurred, because of the decline of marriage, the burden that children became and the infertility of the more intelligent classes. Constant warfare was a factor, and the encouragement given to the so-called "proletariat" or producers of offspring. These were the vagabonds, paupers and degenerates, who were encouraged to propagate, for they were exempt from all civil or military duties and from taxation. Rome paid the penalty.

The decline of Arabian civilization is a good example of the effect of perpetual warfare and of miscegenation of an able people. Marriage was allowed with any race, black or otherwise, provided the Mahometan faith was embraced.

With the birth of each civilization was sown the seed of its dissolution. Need this always be ? With our present scientific knowledge can this decline not be stayed or even reversed ? The inevitable source of the dissolution of past civilizations has been the degeneration of its human material, which has been supplanted by an alien and more virile stock. Until man shall root out and prevent the bad, shall encourage and cultivate the good human element, so long will civilizations be and cease to be. Dare we assume that there will be no cycle to western civilization?

Hope for our civilization dawned with the scientific era, but unfortunately with the overwhelmingly rapid growth of knowledge and the accumulation of scientific facts arises the possibility of a still more rapid decline of man, both mentally and physically, by their unscientific application. Our knowledge has outrun our wisdom. The making and the marring of the race lies in the hands of science. So far, from civilization's point of view, the scales appear to be weighted heavily on the marring side. Even the many physical wonders of to-day, the many apparent advances in medicine, may be powerless to delay for one moment the inevitable. They may serve only to precipitate that descent into oblivion which has overwhelmed past civilizations, unless the application of scientific discovery ceases to be uncontrolled. The necessary conditions for the rise and maintenance of a race are well known—a virile stock, exhibiting good physical and high intellectual qualities, conjoined with initiative, aided perhaps by environment, *but based and grounded on heredity.*

What is this grounding of a successful race on good heredity ? Heredity is described as the mental and physical characteristics transmitted by parents to their offspring. What proof have we that such transmission exists, and that the good and bad within us is handed on to the next and future generations ? A complete handing on of all characteristics does not occur. If it did we might label it with the symbol 1·0, whereas hereditary transmission does not exceed 0·5, which is called the " coefficient of heredity."

Does a race advance or decline by virtue of heredity or environment, by nature or by nurture ? Does what is bred in the bone come out in the blood ? Is a man a chip of the old block ?

As Johnson says: "The social workers of to-day imagine they are improving the race by improving the conditions under which the people live. Few things are farther from the truth. Human nurture as opposed to Nature—in other words, cultural environment—has very little permanent influence on human stock. All experiment and observation offer evidence that the characteristics which an individual inherits from his parents remain remarkably constant under all ordinary conditions to which they are submitted. That constancy appears the more marked the higher we ascend in the scale of evolution. Low forms of life may be made to show change by outside influence. In the higher and more differentiated forms, however, it is found more and more difficult to make any change in them. Their characteristics are more firmly fixed at birth. When we arrive at the highest form, man, even such powerful influences as education and nutrition, varied within their ordinary limits, have *no* power to alter his inborn capacities due to heredity. A man may add by nurture a certain amount to his muscles, but there is an hereditary limit beyond which he cannot develop them. The same holds in games of skill. A certain proficiency may be reached, but the great exponents are born. Environment merely brings them to full fruition and increases their lead over those less fortunately bred."

A dozen men may be crammed to the same extent for an examination. Will their marks be the same? Nature enables the more capable to outstrip the less still further.

Galton, in his study of ordinary and identical twins, found that the former differ widely in capacity and temperament, despite being under the same environment; whereas the identical twins, however

different their nurture, remain so alike that their own mothers cannot tell them apart. They exist with but one thought, word and deed between them. If nurture held as the prime factor in development the opposite should hold good. Nurture fails entirely to alter the inborn nature which prevails.

An interesting example of the persistence of inborn good and evil is seen, among many of its kind, in Dugdale's history of the Kallikak (or good-bad family). Martin (Kallikak), a young soldier of good stock, had an illegitimate son by a feeble-minded servant girl. Several years later he married a woman of good family, by whom he had several children. The legitimate children all turned out well and founded one of the most distinguished families in New Jersey. In this family and its branches is found every good type of citizen—judges, lawyers, doctors, educators, traders and landholders. There were no immoral women and only one man sexually loose. In contrast to this, from the illegitimate son of the feeble-minded girl 480 descendants have been traced: 143 were obviously feeble-minded, 33 were prostitutes, 24 confirmed alcoholics, 36 illegitimates, 3 epileptics, 82 died in infancy, there were 3 criminals and 8 brothel keepers. Is this contrast the result of nature or of nurture? Would environment have changed the superior people to inferior and vice versa? The slum man remains the slum man, and will convert any environment into a slum; he is born, not made.

Popenoe and Johnson, in *Applied Eugenics*, say: "There is no evidence worthy of serious consideration that proves the transmission of an acquired bodily characteristic. Lamarck has few supporters nowadays. Nearly all evidence is adduced from mutilations, diseases, the results of use or disuse, and physico-

chemical effects or environment. Women are not born with pierced ears or Jews without foreskins; the dog and sheep, despite generations of docking, still arrive in this world with the usual appendage; the feet of Chinese children show no deformity at birth. There is ample explanation of evolution in the abundant supply of germinal variations which every individual presents. The same holds good of purely mental processes, such as instincts. There is no proof that habit often repeated becomes instinct, and is handed on by the individual to his descendants, to become racial instinct. The inheritance of acquired characters need not be reckoned with in applied Eugenics."

As Poulton says: "The achievements of the race, and its accumulated social experience, which should be called tradition, may be handed on, but must not be confused with heredity. Whatever wisdom, natural gain or language is passed on from one generation to the next—one generation stands on the shoulders of the other."

But for biological heredity each generation must always start from scratch. Biological improvements can only be made through selective mating.

Jean Jacques Rousseau popularized the idea that all men are born equal, and the Socialists still cling to it. There is no greater fallacy. Nothing is more obvious, on the slightest investigation, than that every grade of mental and physical ability exists, from the genius to the idiot, the athlete to the paralysed; and yet the environmentalists maintain that nurture will efface these differences. Equal opportunity is useless, it serves but to increase the lead of inborn ability.

The fundamental physical and mental differences in each and every human being are inborn. As Stoddart says: "There is an iron law of inequality in man.

It is due to heredity, with the fortuitous variations that accompany it throughout the organic world."

Galton in 1869, in his *Hereditary Genius*, first investigated the production of superior people. From a careful statistical investigation of a great number of famous Englishmen, Galton found that an eminent father was infinitely more likely to have a distinguished son than a mediocre parent. Of many cases cited he found that the son of an eminent judge had a one in four chance of being distinguished, whereas for the son of a man picked haphazard from the population the chance was only about one in four thousand. That this is not environmental, and due to the fact that the obscure man never gets a chance, Galton showed from the history of the papacy. Where it was the custom of the Pope for centuries to adopt a nephew as son and advance him in every way, if opportunity is all that is necessary these men should have reached distinction in the same proportion as the sons of eminent men; but they reached eminence only such as would be reached by the nephew of a distinguished man, which is much less than that of a son. Galton found that half the great men of England had a distinguished close relative.

Wood's statistics in America, where caste lines are not supposed to exist, confirmed Galton most strikingly. To meet the objection of environmentalists Wood investigated the royal families of Europe, where environment is uniformly favourable; and if opportunity rather than hereditary capacity were all that is necessary for success, most members of this class should have been successful. Wood's studies led to a contrary conclusion. Royal genius and ability is a definite "family matter," concentrated in isolated chains of closely-related individuals. One

chain centres in Frederick the Great, another in Isabella of Spain, a third in William the Silent, and a fourth in Gustavus Adolphus. Moreover, inferiority in royalty is equally segregated, royal dullards and degenerates also running in families.

If one accepts heredity as the all-important factor in the production of a superior or inferior people, and if one is disposed to regard the failure of civilizations in the past as due to a gradual deterioration of their races, what stage has been reached by western civilization?

Many thoughtful people consider that our civilization has already passed its zenith, and that the rapid parabolic descent has already begun. We have heard ourselves described as a C3 nation, in that the standard of later recruits was extremely low both mentally and physically in the War; and even before the War between 300 and 400 men in every 1,000 were rejected as unfit for military service. An investigation was made in Sheffield in 1919 as to the mental efficiency of its manual workers, "men and women of Yorkshire and Lancashire, which have a reputation for the vigour and achievement of their sons and daughters. 866 men and women, in equal numbers, were judged by their personalities and life histories as to their ability to cope with the problems of life in a satisfactory manner." Of these, 22 per cent. were found to be of character, often of fine character, and quite able to deal with life and its problems; 70 per cent. were without positive qualities and unfit to vote; 8 per cent. were a bad lot—vicious and depraved.

The statistical investigations by Majors Yoakam and Yerkes in America of 1,700,000 males examined for war service by the Binet-Simon tests is but one of many evidences that all is not well with western civilization from the point of view of either physical

or mental capacity. If these 1,700,000 are assumed to be average specimens of a population of a hundred million, then the average mental age of Americans is only about that of a child of fourteen, forty-five million will never develop beyond the mental capacity represented by the intelligence of a child of twelve years, only one-eighth of the population will ever show superior intelligence, and less than one-twentieth can be considered talented.

Compare this, as Stoddart says, with the population of England, one twenty-fifth of this size, which produced the men of the Elizabethan age : Shakespeare, Ben Jonson, Marlowe, Harvey, Bacon, Drake, Raleigh and Hawkins, and these are but the individual geniuses. Besides them there grew up a splendid school of dramatists, a fine architectural style, great pioneers in science and philosophy, brilliant navigators and explorers. In comparison with this record the geniuses that arose in the World War would be hard to find.

To quote from Popenoe and Johnson in *Applied Eugenics :* "Men differ — these differences are inherited, so that the make-up of a race can be changed by any method which will alter the relative proportion of the contributions which different classes of men make to the following generation. From a eugenist point of view it is enough to know that mental and physical differences are inherited—how much is not important here. Research has advanced far beyond the primitive Mendelism conceived fifteen years ago. The modern view being that, instead of allotting one factor to each characteristic, students now believe that each individual characteristic of the organism is induced by the action of an indefinitely large number of factors, and are now forced to the belief that each factor affects an indefinitely large

number of characters. Thus one factor in the sweet pea changes not only height but colour of foliage, length of internodes, size and arrangement of flowers, time of flower opening, fertility and variability. Feeble-mindedness is not due to a unit character. Intelligence is due to the inheritance of a vast but indeterminate number of factors of various kinds. Hence all grades from the genius to the idiot; but much psychological analysis must be done before the inheritance of feeble-mindedness is solved. However, it can be said of mental traits as others, that 'like tends to produce like'—low-grade mentality generally comes from ancestry of low mentality and vice versa. 'A good tree cannot bring forth evil fruit, neither can a corrupt tree bring forth good fruit.' "

In the past natural selection has been responsible for the improvement of the race. Popenoe and Johnson say that "during the last century the philanthropic spirit and the progress of medicine have done a great deal to interfere with natural selection. In some ways selection of the human race has almost ceased, in many ways it is actually reversed; that is, it results in the survival of the inferior rather than the superior.

In the olden days the criminal was summarily executed; the weakly child died soon after birth through lack of proper care and medical attention; the insane were dealt with so violently that if they were not killed by the treatment they were at least left hopelessly incurable, and had little chance of becoming parents. Harsh measures all of these, but they kept the germ plasm of the race reasonably purified.

To-day the inefficient, the wastrel, the physical, mental and moral cripples are carefully preserved at public expense. The criminal is turned out on parole after a few years to become the father of a family.

The insane are discharged as "cured," again to take up the duties of citizenship. The feeble-minded child is painfully "educated," often at the expense of his normal brother and sister. In short, the undesirables of the race, with whom the bloody hand of natural selection would have made short work of early in life, are now nursed along to old age. "Of course, one would not have it otherwise with respect to the prolongation of life. To expose deformed children, as the Spartans did, would outrage our moral instincts; to chloroform the incurable is a proposition that almost everyone condemns; but the philanthropic spirit is leaving a staggering bill to be paid for by posterity."

Nowadays, while failing to reproduce themselves, the function of the superior people is to support the inferior, who reproduce as three to one of the superior (Loudon). The scientific man has on the average about seven-tenths of an adult son. Davenport, the biologist, calculated that at the present rate of reproduction a thousand Harvard graduates of to-day would have only fifty descendants two centuries hence, whereas a thousand Roumanians to-day in Boston, at their present rate of breeding, would have 100,000 descendants in the same space of time. And about the same holds good for the graduates of our older Universities and the proletariat.

Plato in his *Republic* said of Æsculapius that "he revealed the healing art for the benefit of those whose constitutions were naturally sound, but that where the constitution was thoroughly diseased to the core he did not attempt to prolong a miserable existence . . . and suffer his patients to beget children, in all probability, as diseased as themselves."

There is in existence to-day, and there has been for years, a perverted humanitarianism. It is that

which would support the wastrel at public expense; that insists on the preservation at birth of the Mongolian idiot; that would multiply the insane and mental deficient at the expense of the efficient, rather than sterilize them to reproduce no more. It cries aloud at vivisection, preferring that the flesh and blood of others should continue to suffer rather than put an animal through an experiment — no more painful than man is constantly being submitted to by surgery. This humanitarianism would abolish corporal and capital punishment. It is often like that of an old lady I once knew who was so humane that she could not even kill a flea, but kept for them a special old red flannel petticoat. It is that mistaken philanthropy which supplies the funds even for the provision of pocket-handkerchiefs for the heathen. Surely this type of humanitarianism is anti-social and anti-racial.

The question I would ask you to consider is: Has medicine interfered with natural selection? I think one can definitely say that medicine, scientific or otherwise, has concerned itself, primarily and always, with the preservation of the individual, irrespective of his or her value to the race. The race has not been even a secondary consideration in its activities. It has striven to make and been often lauded for its discoveries for the preservation of the individual, whether they be fit or unfit, desirable or undesirable. Some authorities are of the opinion that the Great Plague was chiefly a disease of the "masses," the less intelligent people being destroyed in enormous numbers, probably with benefit to the stock. Small-pox was one of these eliminators, and the question as to which is the better eugenist, the public health medical service with its vaccine or the anti-vaccinationist, gives one pause. The anti-vaccinationist exists mainly

among the least intelligent of the people. It has been stated that fifty per cent. of these are unvaccinated. Given a thoroughly virulent small-pox epidemic, is it not probable that the anti-vaccinationist might make an enormous contribution, a holocaust, to racial betterment, proving himself, unintentionally, a better eugenist than medicine with its vaccine ?

The achievements of the public health authorities in reducing the infant death-rate cannot be regarded with complete equanimity, since they chiefly affect the worst stratum of society, who already out-reproduce the best as three to one. The child welfare clinic is not without its drawbacks. Nature removes many weaklings in the first year, but numbers of them are now triumphantly preserved to reproduce their like.

Is the fight against tubercle so particularly desirable ? The mortality of the white man's plague has, in some places, fallen fifty per cent. In other words, this fifty per cent. may now survive for a longer age of reproduction ; the diathesis is thereby spread over a greater and still more great number of the population. Is this an advantage to the race ?

The result of many of the activities of the public health medical service appears only too often to be a reversal of natural selection. It might conceivably be better for the population if all those with hereditary diseases died before the reproductive age, or were rendered sterile. There seems no sound reason, for instance, that justifies the survival of the congenitally hydrocephalic, the Mongolian idiot, the achondroplasic, often a misery to their parents and to themselves. Is it not a perverted humanitarianism, an actual cruelty to the individual thus afflicted and to the normal members of the family ? The discovery of insulin may prove detrimental to the race, by

increasing the number of diabetics to the extent of the inheritability of the disease: *already* many are now surviving to reproduce. If heredity holds in cretinism, our knowledge of the value of thyroid medication may not benefit human stock.

The greatest canker in our modern civilization are the mental deficients, who with the insane are slowly and steadily levelling down the general national capacities. Three hundred thousand of them in England, at a low estimate, in and through the general population rapidly multiplying their like, and, which is even more serious, producing the sub-man as ten to one of themselves. Has medicine made any serious effort to grasp and root out this evil?

Nature has given us natural selection to maintain a high standard both physical and mental. Can one honestly say that medicine has aided and abetted her? Medicine appears, on the contrary, to be thwarting Nature in many ways by encouraging the survival of the unfit, for which a retribution is already established in the preponderance and swamping of the good by evil stock. What can one hope for western civilization with the scientific outlook such as it is?

Science as a whole, and scientific medicine in particular, is out of control, it moves regardless of the race, and not infrequently wields its knowledge like a boy with a loaded gun. It is time that medicine regarded its duty to the race as its chief and highest function, for a raising of the national mental and physical standards means greater health and happiness for all. Can we say that medicine is not responsible for the existence of a vast number of our sick? If this is so, is not medicine therefore responsible for the expenditure of housing and treating them. It is

the duty of the medical profession to set its house in order, and by its constant efforts to improve the race to be able to show as a criterion of its work that the need for hospital beds grows less and less ; to demand more and more is but a measure of its incompetence. It would be indeed an achievement to diminish the necessity for beds by half and to eliminate the ament.

The problem to be solved is the raising and maintaining of the people at a high level of mental and physical capacity, on which civilization depends, and compared with which all other questions whatsoever are of little import. A satisfactory solution to this is vital to the arrest of the parabola's descent. It is the only means by which man, by his own reason and effort, can ascend to the heights, for without doubt there is a plasticity within him which may lead to heights undreamt of.

The education of the public on the vital importance of race maintenance and improvement is a paramount need, to which the medical profession as a whole should devote some of its energies. It should at the same time concentrate on practising that which it should preach, and seriously endeavour to eliminate its own means of existence, by attempting to produce an A1 rather than to encourage a C3 nation.

Plato says in his *Republic :* " Where can you find a more signal proof that a low and vicious education prevails in a State than in the fact that first-rate physicians are in request . . . even among those who lay claim to the birth and breeding of gentlemen." The aim of the profession should be to produce such a people that the demand for sick accommodation is reduced to a minimum.

There are two means by which this can be approached. First and most easily achieved, once

public interest is aroused, the prevention of procreation by the grossly unfit mentally, the feeble-minded, who are, as Dr. Fisher says, responsible for the whole burden of disease, defect and pauperism. Secondly, by providing each and every means that will discourage the reproduction of the sub-man, and, the corollary to this, the encouragement of the birth of those of superior intelligence. Both these are duties of the State in co-operation with medicine.

The ament must be dealt with first by one of two methods, namely segregation and sterilization. Complete segregation of aments can be at once set aside as impracticable, from the point of view of expense and uneducated public opinion. But partial segregation—which already exists for the insane, the mental defectives, the criminal and the potential criminal—should be complementary and supplementary to sterilization.

Compulsory sterilization is at present out of the question for the feeble-minded and insane, but voluntary sterilization *already* exists. In California the parents of defective children are beginning to bring these for sterilization to prevent "accidents," and every encouragement should be given by medicine and the State to this, as a means of public education and racial improvement. In the Swiss Canton de Vaud in October, 1928, was passed a law that people suffering from mental infirmity, who can only produce tainted children, shall be dealt with by a "Council of Health" by such means as shall prevent their propagating. It is probable, says Fisher, that adequate measures to prevent reproduction by aments would reduce them by one-third in the first generation.

The marriage of mentally-diseased people should be forbidden as long as they can reproduce, and the

discharge from an institution of the potentially fertile should be forbidden, save after sterilization. The same should hold for the deaf-mute, the congenitally blind, those with pronounced tubercle, and others suffering from hereditary diseases. Popenoe says that sterilization will prevent the birth of few, if any, superior people, but of many inferior. The sterilization of mental deficients runs no risk of losing genius or great talent. A beginning must be made on the ament by sterilization, and though it does not touch the great mass of sub-men already existing, who have arisen from the feeble-minded, if the ament be their breeding-ground it will at least lessen its fertility.

It has, perhaps, ill behoved me to venture on so vast a subject such as this, to put before you a problem that you all must know so well, and many of you be far better able to pass judgment on than myself; which, moreover, has been voiced by far more able members of our beloved profession. My excuse must be that the subject has long interested me, and I felt moved to present to you, however redundantly and inadequately, a crude and superficial presentation of what none can deny is the most important question of all time.

One has a vision of a world in which science has lost its greatest opportunity, in which civilization has again failed, order degenerating into chaos, such as now exists in Russia, to be followed by barbarism and even savagery. But a vision also one has of a world from which men, such as myself, have been long since eliminated, where the eminent of to-day are as the sub-man, and where men with their great foster-mother Medicine walk as gods.

HOSPITALS—
VOLUNTARY OR SELF-SUPPORTING ? *

BY

R. J. A. Berry, M.D., F.R.C.S., F.R.S. Edin.,

Medical Director, Stoke Park Colony, Stapleton, Bristol ; formerly Dean of the Faculty of Medicine and Professor of Anatomy in the University of Melbourne.

In 1927, as the accredited representative of the State of Victoria and the University of Melbourne, I travelled some 30,000 miles on a special mission of inquiry into Hospital and Medical problems. As a result of this inquiry it became clear that the world's practice to-day is to concentrate all medical effort—hospitals, laboratories and pre-clinical sciences—on the one spot, and to endeavour to bring all medical knowledge to bear on the study, treatment, and prevention of disease. This new procedure has resulted in the creation of new types of hospitals, and has been responsible for a large amount of new medical and hospital building and administration. This newer form of medical policy may be termed the " Medical centre devoted to community health, and its associated hospital, the self-supporting hospital," whilst the older type, with which most of us are familiar, is the dispersed and scattered medical school and laboratory with the associated " voluntary hospital."

* An address delivered in Melbourne to a lay audience after consultation with the President and Council of the Victorian Branch of the British Medical Association.

The world's best modern medical practice is to-day based on a tripod—a tripod of medical education, research and administration—and the whole is entirely directed to the patient. The patient should be treated as an individual, not as a separate series of specialities, hence the necessity to-day of concentration of medical effort, and not its dissipation in non-correlated hospitals and laboratories, as in Melbourne and Bristol at the moment. The complete medical school is, therefore, the first essential; and the second is the closest association of that complete medical school with a hospital or group of hospitals. The hospital is thus the second, not the first, necessity of the medical centre devoted to community health, for it is the obvious duty of modern medicine to keep people out of hospitals rather than in them. Two corollaries follow: (1) That the hospitals of the medical centre should be open to all classes of patients, irrespective of their poverty or means; and (2) that the association of the word "hospital" with the erroneous modern democratic notion of getting something for nothing—free treatment by the medical profession—should be abandoned.

Great Britain is the home and origin of the voluntary hospital, and as first introduced it was simply a charity designed for the indigent poor. By "voluntary" was meant free service by the medical profession; free administrative service by the lay and business communities; free and voluntary financial contributions on the part of the public, and voluntary attendance by the poor and sick. The whole was originally a noble charity. It is, therefore, no wonder that there are still those who are loath, in defiance of all evidence to the contrary, to desire any change in a scheme which has done such magnificent service

for rather more than a century. On the other hand, it is surely obvious that the future of this voluntary principle, as applied to hospitals and medical service to the community, is fraught with difficulties and national dangers, and to-day there are many in all parts of the world who see both the drift and the precipice confronting the voluntary hospital.

Originally, and up to the beginning of the present century, the British voluntary hospital did fully meet the needs of the times, and it compared favourably with the hospital system of any other country. To-day English expert opinion urges against it, at least in so far as its medical services to the nation are concerned, that the voluntary hospital system (1) has not developed in proportion to the needs of the community; (2) has failed to meet the growing needs of the middle classes; (3) has largely failed to maintain an adequate standard in regard to sites and buildings, and has not recognized the absolute necessity of the associated pre-clinical laboratory in the study and treatment of disease; and (4) has failed to co-ordinate its hospital services in the interests of the community, and must continue to do so so long as its several units remain dissociated, non-correlated, and merely mutually competitive.

The present generation has become so accustomed to the prevalent and perverted notion that something can be had for nothing—education, medical attendance, protective doles from the State, and the like—that it forgets, if it ever knew, that free medical treatment in voluntary hospitals is the growth and practice of little more than a century, and that such free medical treatment was then, and is now, only given on the distinct understanding that the recipients of this medical charity are really the poor and indigent sick.

But this is very far from being the case to-day, and there is probably not one so-called voluntary hospital of first-class standing in the British Empire which has not been compelled to depart from the main principles of voluntaryism. Voluntary hospitals are now compelled to demand payment from their patients for board, lodging and food, and for financial reasons associated with their own balance sheets admit many others than the indigent sick. But the third great principle of voluntaryism—upon which all depends—free medical service by the profession is still retained in its original integrity.

During the last twenty-five years, and especially in the last fourteen of these, there have been two main factors at work, insidiously, slowly, but surely, tending to destroy the voluntary principle of hospitals: (1) the rapid progress of medicine, intensified by the war and its problems, for medicine learnt as much from the war as did aviation; and (2) that war itself—the greatest and most destructive in history. The former has compelled all hospitals to extend their medical activities, to embark upon many new departments, to expand old ones, to handle an ever-increasing number of patients, to install most expensive therapeutic plants, with the result that their expenditure has doubled and trebled. The latter, on the other hand, has simultaneously impoverished the peoples of Great and Greater Britain, and has thus largely impaired the sources of hospital revenue.

These facts can be shown in two very striking ways. Between the years 1913 and 1925 the cost of upkeep per bed in the London voluntary hospitals has increased by 100 per cent., and of this present-day cost of £200 per bed per annum—it is more in Melbourne—some £93 has to be found by piteous charitable appeal—an

appeal made to the most heavily-taxed people in the world, staggering under a load of debt and taxation.

Further, there have been added to London's hospitals since the war some 1,600 additional beds. It is difficult to understand how the voluntary system of charitable doles to voluntary hospitals, largely and increasingly unable to meet the present requirements of either patient or advancing medical science, is to cope with this new burden. Many patients who formerly would not only have sought and paid for private medical advice, but would have themselves contributed their charitable offerings to the voluntary hospital and the indigent sick, now do neither one nor the other, but themselves seek free hospital medical treatment, partly from economic reasons, and partly because there is a growing feeling that the well-equipped hospital can give better service than the private practitioner or the private nursing home.*

It is, therefore, no wonder that Dr. Joseph Griffiths, of Cambridge, writes in 1927 that "I believe it would be better if all were now to open their eyes to see the new movement which is rapidly replacing the old voluntary or charity systems, with their serious limitations." Or that the *Westminster Gazette* can say: "Unless the voluntary hospitals can revolutionize their finance, they are doomed." Or that Prince Arthur of Connaught tells us that "the popular impression that the large voluntary hospitals are merely charitable institutions must be replaced by a consciousness that they are the guardians of the nation's health." If this be so—and there are few experts who would deny it—then it is clearly a national

* Contributory schemes which now exist in Bristol and other cities may make these remarks inapplicable in every locality, but such schemes are the exception, not the rule.—EDITOR.

blunder to expect them to function apart from the medical centre devoted to community health, or to be financed by public and insufficient charity and the voluntary and gratuitous services of the most eminent surgeons and physicians, or to continue longer to believe that medical skill—one of the most expensive things in the world to acquire—can still be had for nothing.

Educated as I was under the British voluntary system in the height of its prosperity and strongly prejudiced in its favour, it is, nevertheless, impossible to pass, as I did in 1927, from an examination of the voluntary hospital system of Britain to the self-supporting types of Canada and America without being profoundly impressed with the latter.

In all the great Canadian and American hospitals visited by me totally new hospital principles have been put into operation in order to ensure that the patient shall have the best that medicine has to offer. First, there is hardly anywhere a general hospital, of the type of those with which we are familiar in Great Britain and Australia, totally divorced from the pre-clinical and scientific laboratories of a medical school. The whole staff, university, laboratory, pre-clinical and clinical, is concentrated on the one spot, on the group of associated hospitals, and thus every patient in those hospitals may benefit by the collective skill of the whole, rather than only the part as in Melbourne. Second, these Canadian and American Class "A" university hospitals are open to all, irrespective of the social or financial status of the individual, and it is exactly here that these Canadians and Americans have so boldly departed from the older British voluntary system confined to the indigent sick.

It is to-day the clear and obvious duty of our large medical centre hospitals to give every type of patient

free access to their medical facilities and beds, for only there, where all medical effort is, or should be, concentrated, is it possible for medicine to give of its best; and all patients are entitled to that best, and should not be asked or expected to simulate poverty in order to get it. But the labourer is worthy of his hire, and it is illogical in the extreme, nay, it is grossly unfair, to suppose and assume that, because the British type of voluntary hospital was originally based on voluntary and gratuitous service by all concerned, that this more modern and totally different duty of medicine can be maintained on the same basis, that is, free service by the medical profession. In other words, if all classes of patients are to be admitted to our great medical centre Class "A" hospitals, then the medical staffs of those hospitals must be paid for their services. In every one of the great Canadian and American hospitals visited by me in 1927 I found every member of the staffs of both medical school and hospitals, pre-clinical and clinical, paid and well paid for their hospital services, and a contented staff means efficient service. The educated Canadian and American has at least learnt the futility of constantly seeking something for nothing.

Mr. A. H. Leaney, of Birmingham, a non-medical manager of the general hospital in that city, who made like myself a special study of the Canadian-American self-supporting hospital, sums up his impressions as follows:—

1. In the self-supporting hospital all classes receive equally good care.

2. All have the benefit of the resources of a modern hospital.

3. All classes become acquainted with the work of the hospital and give it moral and financial support.

4. The unsatisfactory system of private nursing homes is replaced.

It is quite certain that if universities, hospitals and medicine generally are to do their duty to the community, medical schools and hospitals must have adequate financial support, and this cannot be much longer maintained under the present system of inadequate financial Treasury grants and piteous appeals to the public. In the Canadian-American self-supporting hospitals the sources of revenue are :—

1. Receipts from endowments. No wealthy man dare die in the States without leaving something to his university, home town or favourite hospital.

2. Payments for medical and other hospital services from middle class and wealthy patients, from both of whom, but particularly the latter, certain profits accrue, just as they do in any other business or profession.

3. Payments from province, state, city or municipality for the actual costs of board, lodging and medical treatment accorded those of their people who, unable to pay themselves, still seek hospital treatment.

In all these self-supporting hospitals accurate "costing" accounts are kept of every patient. There is a complete register of the actual costs of his food, board, lodging, medical and specialist fees and the like. In the cases of the paying patients the patient himself discharges the bill, and as it includes his medical fees, these are paid over to the medical consultant in charge of the case. For the indigent sick, unable to foot the bill, that bill is presented to the city, borough or municipality whence he came, and is discharged by them. Under this system the medical profession and everybody working in the hospital receives payment

for services rendered. The hospitals are not in debt; there are no piteous appeals for charity; there is no inferiority complex on the part of any paying patient attending the hospital; there is no pauperization of the people, and there is no exploitation of the medical profession, of which last there has, perhaps, been in the past a little overmuch.

There can surely be few who do not view the future of our voluntary hospitals with both apprehension and misgiving, and there can be none, at least in the medical profession, who do not realize that to-day concentration of medical effort is the key to the position, especially in a university town. Bristol is indeed fortunate in having a medical school in its midst, but it seems just a little doubtful if the necessity for radical reconstruction of schools and hospitals on the one spot, as has been so ably pleaded by the Professor of Surgery in this University, has yet received the serious consideration which is its due.

The medical visitor to Winnipeg, Toronto, Montreal, or any of the first-class American universities will be astounded to see that everywhere, since 1920, there has been a wholesale reconstruction of hospitals and university medical schools, and always with the same objective—the concentration of all medical effort, science and skill on the one spot, for the good of the patient and the better education of the medical man. Nor are these North Americans alone in their views as to the necessity to-day for the unification of both clinical and pre-clinical sciences in the only place where they can be really effective, that is the hospitals and schools of the medical centre, for Birmingham and Aberdeen have now both taken the preliminary steps for such a reconstruction.

By a curious coincidence it was my pleasurable

task, in connection with the report which I had recently to make to the Victorian Government on this very problem, to visit both Bristol and Cardiff, for the study of their respective methods of handling these modern teaching hospital and university problems. The conclusion was formed that, though Bristol had yet a long way to go before attaining the modern ideal, it was at least an excellent position city for such a concentration of medical school and hospital. The Centenary of the Bristol Medical School approaches. Could there possibly be any better way of celebrating such a noteworthy occasion than by leading the van of English medical progress, and fusing our great hospitals and Medical School into one even greater Bristol University Medical Centre?

THE INFECTIVE FACTOR IN THROMBOSIS AND EMBOLISM.

BY

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THE subject of embolism may not appear at first to be one of great interest to the general practitioner. I say this because it is rarely that one hears the words embolism and infarction in discussions between friends in general practice. I venture, however, to suggest that it is a subject of great practical importance, on account of the common occurrence of embolism in general practice. My attention was first drawn to the matter during an investigation, which has now extended over nine years, into all the cases of influenza (now numbering well over 2,000) which I have visited in their homes. I found that the first case of cerebral embolism which I saw in the period mentioned occurred as a complication of a definite attack of influenza in the March, 1919, epidemic; this fact induced me to analyse other cases of embolism, and a conclusion I could not resist was that influenza was one of the most important predisposing causes of embolism. Moreover, on account, latterly, of the increasing prevalence of influenza—a disease which has appeared in epidemic form almost every year since the outbreaks of 1918—embolism, which one looked upon not so many years ago as a clinical rarity, has become a common

phenomenon in one's practice. The impressions on the subject which first occurred to me in 1919 have been strikingly strengthened since August, 1925, since when I have had an exceptional number of cases of influenza and acute tonsillitis. It will be seen that many of the cases here described were seen in this latter period; I have intentionally chosen them as being most fresh in my memory.

It is my main purpose, indeed, in this essay to direct the attention of the reader to the occurrence of embolism in the familiar motley which we call "influenza," and I hope to produce sufficient evidence to show that *any* variety of embolism may occur during or after influenzal attacks. Embolism, for the most part, has been associated in the text-books with injuries, operations, and disease of the heart valves. It is true that venous thrombosis is described in all books as a possible complication of any of the infectious diseases, and that embolism may therefore be a rare complication of any of the latter; it is true that in pyæmia we have a recognized series of embolic processes. Yet we have so great an authority as Lockhart-Mummery[1] making the following statement: "There is no proof that the presence of septic organisms, or their toxins, in the blood induces intravascular clotting; and, on the other hand, septic diseases which are not the result of wounds, such as whitlows and abscesses, sapræmia, scarlet fever, etc., are not complicated by emboli and infarcts." I hope to prove this statement certainly not true for influenza and acute tonsillitis, both of which I suppose can be put in the category of septic diseases.

The fact, also, that I have not seen in any description of influenza or tonsillitis any stress laid on these embolic phenomena, is an additional reason

for broaching this subject now. I believe that the symptoms in many obscure cases that puzzle us are often of an embolic origin; reference will be made to such cases in the paragraphs that follow.

Perhaps the most useful way of discussing the subject will be by considering the more important types of embolism separately.

Pulmonary Embolism.—This is the most familiar type of embolism, as it is generally the easiest to diagnose. It is the type we read of most frequently. It occurs after injuries of the long-bones and severe contusions; there are the sudden deaths from this cause after abdominal and pelvic operations and after child-birth, tragic examples of which most of us can call to mind. These cases are explained as being due to the formation of a clot in the veins of the pelvis or lower limbs, which empty direct into the right heart, and thus have direct access to the pulmonary artery. The apparently anomalous fact that operations on the gastro-intestinal tract—the veins of which open into the portal vein—are also sometimes followed by pulmonary embolism, is explained by some as also being due to clotting in the veins of the pelvis and lower limbs, the clotting in these cases being said to be due to the prolonged immobilization in bed to which these operation cases are necessarily subjected.

There is no doubt that in the past the tragic suddenness of the fatal event in many of these cases has distracted our attention from the minor or non-fatal cases, which are certainly more common than the fatal cases, and we have been apt to forget that there are *degrees of embolism* which depend upon the size (and nature) of the clot, and therefore on the amount of pulmonary circulation obstructed. This fact was emphasized at two recent discussions on post-operative

pulmonary embolism, at which able papers were read by Lockhart-Mummery [1] and E. C. Lindsay. [2] Wharton and Pierson [3] had previously expressed it as their opinion that 40 per cent. of cases diagnosed as pleurisy and 12 per cent. of cases diagnosed as pneumonia after operation are in reality cases of pulmonary infarction and embolism. Curiously enough, I came to a very similar conclusion long before I had read of these observers' work, namely, many of the cases which we diagnose as influenzal pleurisy and influenzal pneumonia are really examples of pulmonary infarction, and a certain proportion of the sudden deaths which occur after influenza are due to massive pulmonary embolism. Unfortunately, post-mortems are difficult to obtain in general practice. It took me many years to realize these facts, but I was persuaded of them by comparing frank cases of pulmonary infarction, such as one sees after injury and abdominal operation, with the type of case so often seen in influenza. I have in mind, as I write, three cases seen in the last few years. The first was a fracture of both leg-bones, the second a severe crush of the ankle. Both these cases, about ten days after receipt of the injury, developed an agonizing pain in the chest accompanied by cough, fever, dyspnœa and cyanosis ; rusty sputum was present, and the physical signs were those of a fairly extensive pleurisy with no suspicion of bronchial breathing. In these cases one naturally thought of embolism, and the physical signs were those of infarction. The third case, three weeks after operation on a septic gall-bladder, developed slight fever and cough, which were associated with a pleural rub, spat up a little blood, but got well in a few days. Here again "septic embolism" was naturally suggested. Now these cases resemble exactly the "atypical" cases of pneumonia seen during influenza.

Let us take a common type of case which we diagnose as influenzal pneumonia. The patient, perhaps a few days after he seems to have recovered from an attack of influenza or tonsillitis, has an acute pain in the chest, is dyspnœic and cyanosed, spits up bloody sputum, and on examination there is fever, a pleural rub, suppression of the breath sounds and some dulness. We say to ourselves: "There is no bronchial breathing, but I suppose it must be pneumonia." Often the temperature is not very high—perhaps no more than 101° F.—and may be normal on the third day, so that we begin again to doubt our diagnosis, and console ourselves by calling the case a "pneumonia of short duration." This type of case, I submit, is a typical example of a pulmonary infarction. The mechanical, as opposed to the inflammatory nature of the case, is seen in the fact that the patient may be out walking on the tenth day! Another important point is that the sputum, which I am afraid the doctor does not always ask to see, is quite different from that of pneumonia, and is generally brought up in separate blood-sputa-tenacious lumps of a reddish-brown colour, reminiscent, according to the degree of discoloration present, of plum, gooseberry or strawberry jam. In some cases the lumps of sputum floating in the fluid used to receive it remind one of a grape, the contents of which have been squeezed out of the skin; I have heard a patient say that she spat up "something like a grape." I will henceforth describe this sputum as jam-sputum—the most appropriate name I can think of to describe it.

In some cases of influenza there may be no signs at all in the chest, in others there may be signs of bronchitis. In both cases jam-sputum may be spat up, showing that an infarction is present. This type of

case is often mistaken for phthisis, and may be sent to a tuberculosis expert and even find its way to a sanatorium. Far be it from me to discourage investigation into this type of case, but I am sure many patients have been unnecessarily frightened in this way. I have made the mistake in several cases myself when less experienced ; not a single one of the cases—and I have followed many since 1918—has developed phthisis. In May, 1926, a servant girl suffering from an attack of influenza when home on her holiday, returned to her situation in London before she was properly fit. Shortly after her arrival there she spat up what she described as some " clots of blood." Her mistress took her to a doctor who diagnosed phthisis, and ordered the girl home. As I had seen about this time a fair number of cases of influenza with jam-sputum, I put this girl in the same category. I, however, sent her to an expert, who failed to find any evidence of phthisis. Seen in December, the girl looked hale and hearty.

Both the two previous types of case I believe to be due to small pulmonary infarctions deep down in the lung, and thus causing no definite sign, other than the sputum, of their presence.

The following are the histories of some interesting and typical cases of pulmonary infarction, all of them recent and still fresh in my memory :—

Case No. 1.—G. I. T., aged 37, was seen on 3rd April, 1926. Diagnosis : Influenza and tonsillitis. Temp. 104° F. No cough nor respiratory symptoms. He got well in a few days, but a relapse occurred on the 8th. There was now severe bronchitis and cyanosis. No pleural rub nor bronchial breathing heard. Later jam-sputum expectorated. He developed jaundice, but made a good recovery. No evident heart disease. Seen in August, he said he was very fit. In 1927 he got what looked very much like a coronary infarction.

Case No. 2.—W. R. G., aged 45, a robust man with a sound heart, was first seen with influenza and tonsillitis and a temperature of 103°F. on 18th February, 1926. No cough. His temperature came down, he was much better in every way, and he got up on the 20th. I did not

see him on the 21st. On the 22nd he told me he had been " in agony all night " with a pain in the right chest. There was now severe cough, dyspnœa and cyanosis. The two latter were out of proportion to the pulse and temperature, which were 84 and 99° F. respectively. There was extensive pleural crepitus and suppressed breathing over the front of the right lower chest. I diagnosed infarct. The next day there was typical jam-sputum. The temperature was now normal, pulse 80. An enormous amount of the hæmorrhagic sputum of an unusually sticky mucinous character was voided, followed later by much black (coal dust) sputum ; the latter was evidence of destruction of pulmonary tissue. The sputum was examined pathologically in London, and it was reported that the sputum was undoubtedly from a case of pulmonary infarction, and contained pneumococci, streptococci, and a bacillus resembling B. influenzæ. It is interesting to note that this man, like Case No. 1, also developed jaundice for a few days—evidence, I suppose, of a hæmolytic process. The patient, who was rather fat, lost over three stone during his illness. He took a long time to pick up. The prognosis with so large an infarct seemed doubtful. Seen in December, he looked very well, and an X-ray showed an area of fibrosis in the right lung.

Case No. 3.—F. S , aged 43, was first seen on 4th December, 1925, with a septic throat Three other members of his family were similarly affected during the same week, the condition being epidemic here at the time The man was always unhealthy-looking, but had no definite signs of heart disease that I could detect The patient got much better, and had got up and walked about. On the 13th he complained of an acute pain in the left chest, and on the 14th there was a pleural rub and jam-sputum. When he seemed to be recovering he complained of the same thing on the right chest, where a pleural rub was also heard. The temperature never went above 100° F., was subnormal for the most part, and after the development of a typhoid state some effusion in the right chest was found to be sero-purulent. I considered operation out of the question—we were dealing with a pyæmic condition—and the patient died on 24th December. As there was a history of phthisis in the family, the sputum was examined for tubercle bacilli, but was negative. The condition of the lungs was evidently secondary to the throat condition.

Case No. 4.—(Pulmonary infarction is not an uncommon condition during pregnancy.) Mrs. P., aged 32, seven months pregnant, was seen on 10th May, 1926. She was breathless and cyanosed, but on examination the temperature was only 99·6° F., and the physical signs in the chest were indefinite. As there was a good deal of influenza about at the time, I was inclined to look upon the case as a deep-seated influenzal pneumonia, but on the fourth day of the illness I observed the typical jam-sputum, and on the seventh day her condition was rapidly approaching normal. There was no sign of phlebitis in the lower limbs. The patient went to term, and was confined on 5th July. It is interesting to note that during the puerperium I discovered a small fibroid to the left of the uterus. Possibly some clot was detached from here (see Case No. 6). Seen in December, the woman seemed her old healthy self.

The two following cases were almost certainly examples of fatal pulmonary embolism during the puerperium :—

Case No. 5.—On 4th July, 1921, a healthy woman aged 21, a primipara, died immediately after the third stage of labour was completed. I thought at the time that I was dealing with a case of acute œdema of the lungs. Looking back, however, I am inclined to think that the cause of death was a massive pulmonary embolism, and that the history of a "cold" followed by neuritis a few weeks previously gave the clue to the original cause—influenza. It was certainly curious that I saw, three days later in the same street, a young man with an obvious pulmonary infarction.

Case No. 6.—On 30th August, 1925, a healthy woman aged 39, whom I had attended for an influenzal cold fourteen days before labour, died suddenly on the ninth day of an aseptic puerperium. Some small uterine fibroids were diagnosed after the third stage of labour. The only complaint during the puerperium were some vague pains in the pelvis. At the autopsy (abdomen only) the fibroids were seen and clotting had taken place in the pelvic veins. Here probably the fibroids, as well as the influenza, too a part in the fatal event, which must have been due to pulmonary embolism. A week later a young man on whom I had operated for hernia had a typical small pulmonary infarction, whilst a few days later I saw two cases of cerebral infarction (see later).

I believe that yet another type of pulmonary embolism takes place during influenza. Most general practitioners can remember urgent calls to patients during the influenza epidemics, the symptoms being a sudden pain in the chest accompanied by a sense of impending suffocation. As I happen to live in a congested area, very accessible to most of my patients, I generally have managed to arrive in time to observe the dyspnœa, cyanosis, and sometimes slight fever which are characteristic of these cases; it is probable that if my visits had been less prompt the dyspnœa and cyanosis—which pass off quickly—would never have been observed, and I might have dubbed the relatives "fussy" for sending for me in such a hurry. In several of the earlier cases which I saw I made a diagnosis of "acute cardiac dilatation"—on very little evidence, as the patients were mostly healthy. I am of opinion that the symptoms in these cases are due to pulmonary embolism of a fleeting kind. Perhaps the clot is of a soft nature that breaks up easily; at any rate, the symptoms resemble exactly those which I

once observed when resident in a large hospital, in a patient after an operation for hernia, and which we all agreed were embolic in origin. No definite signs other than those of pulmonary œdema are observed in these cases, though a rise of temperature for a few days after is common, while in some cases the sputum is hæmorrhagic. Probably some of the cases of "acute œdema of the lungs," of which there has been much talk in these recent influenzal years, are of a similar nature. It is only a matter of degree, according to the size and nature of the infarct. If the clot is a large one death takes place, and I have no doubt that some of the sudden deaths after influenza are due to this cause. I have no post-mortem evidence to support my views, and it would be interesting to hear whether the pathologists see these fatal cases of pulmonary infarction—as I believe they must—more often during the influenza seasons.

It is a well-known fact that a non-fatal pulmonary embolism may be followed later by a fatal one (see Case No. 31), and that a pulmonary embolism may be followed by a systemic embolism. Sometimes the pulmonary embolism is preceded by a systemic embolism, and as the condition arising appears anomalous, the condition is called one of paradoxical embolism. I have observed this latter phenomenon on several occasions, and will have a few remarks to make on the subject later.

Systemic Embolism. — Under this heading are included emboli carried through or from the left heart and arrested in one of the systemic vessels. These events are seen classically in cases of malignant endocarditis; here the occurrence of the embolism may be the first clue to the real nature of the case. Many of the systemic embolisms which one observes

during influenza, however, occur in patients with apparently sound hearts, and I think a certain proportion of the emboli must come from the pulmonary veins in such cases; I will refer to both these points later. As stated before, the systemic embolism may precede or follow a pulmonary embolism in the same patient. Moreover, the systemic embolism may occur after injury or operation without the occurrence at all of a pulmonary embolism. To explain such an event, certain observers are at pains to explain that the clot, in order to get from the right to the left heart without affecting the lungs, must pass through a patent foramen ovale. I suspect that there is no need for this ingenious explanation, unless and until it can be conclusively proved that the embolus is derived from the site of operation or injury in all cases.

I will now give a short history of each of the cases whose symptoms I have attributed to systemic embolisms during the period of my investigation.

Cerebral Embolism.—It has been a frequently recurring experience of mine to observe that cases which clinically show the features of cerebral thrombosis occur most often during the influenza seasons, and it is my belief that influenza often takes its toll of the old and arteriosclerotic in this way. The features, however, are not very distinctive, and the diagnosis may be open to doubt. Cases of cerebral embolism, however, on account of their more sudden onset and the development of focal signs, are more easy to classify. I have collected during the period nine cases in which the clinical signs were fairly definite of an intracranial embolism, though I am well aware that it may be asserted that the symptoms were due to encephalitic or meningeal changes. With the analogy of the pulmonary

infarction in mind, however, I prefer to look upon these cases as embolic.

Case No. 7.—A woman aged 56, suffering from rheumatic endocarditis since girlhood, had an attack of influenza and bronchitis during the March, 1919, epidemic. On 14th March she was taken suddenly with a convulsive attack which was followed by aphasia and right-arm monoplegia. Both the latter improved, and the patient got about and lived for four years afterwards.

Case No. 8.—A woman aged 36, healthy, developed aphasia and monoplegia on the fifth day of the puerperium. The latter was afebrile, and no source for the embolus could be found. Practically complete recovery. No association with influenza nor any other illness could be demonstrated.

Case No. 9.—A man aged 53, an old case of " V.D.H.," was labelled (five weeks before the embolism) " cardiac plus influenza." The hemiplegia came on suddenly, the condition improved considerably, but he died water-logged a month after the embolism.

Case No. 10.—A woman aged 52 with high blood pressure and a perforated nasal septum. A convulsion was followed by aphasia and monoplegia during an attack of influenza in the February, 1924, epidemic. Owing to the intensity of the onset and the general condition of the patient, I gave a bad prognosis, but the patient is still (December, 1929) alive, and her only complaint is numbness in the thumb.

Case No. 11.—A rather delicate-looking woman aged 41, but with no actual disease history, had an attack of influenza complicated by aphasia and monoplegia in the February, 1924, epidemic. The onset here was rather slower than in the other cases. There is still some weakness of the right grip, and the patient says she cannot pronounce her Welsh words as before. The improvement, nevertheless, was marked.

Case No. 12.—A woman aged 28, with choreic endocarditis of many years' duration, had a slight cerebral embolism (convulsive attack) on 9th May, 1925. She had not had influenza, though the latter was very prevalent at the time.

Case No. 13.—A woman aged 60, who appeared to show signs of heart failure for two months previously, and whom I had looked upon as a case of " myocarditis," fell down in a convulsive attack on 12th September, 1925; she was unconscious only a short while, but eventually all the signs of a cortical hemiplegia developed, and the patient died on 3rd February, 1926. Influenza was prevalent at the time of the occurrence of this stroke, but I could get no history of an attack in her case.

Case No. 14.—A woman aged 30, a case of old rheumatic endocarditis since 1910, was seen with severe respiratory influenza in May, 1925; influenza of a severe type was epidemic here at the time. Though she had not been " strong " since her rheumatic fever, she had married and borne three children, and had had no definite illness beyond what I had diagnosed as a " septic abortion " in 1921 (though

I have wondered since if her endocarditis was not the cause of the fever at this time). She never recovered from her attack of influenza, became very anæmic, and some tenderness and swelling over the spleen were probably due to a splenic infarct. I had her removed to hospital, but she got no better, and on the very day that I showed her to a medical friend as an instance of a simple endocarditis made malignant by influenza (17th September, 1925) she was taken with generalized convulsions followed by unconsciousness and total hemiplegia, and death in twelve hours. This was a classical case in a patient with malignant endocarditis.

Case No. 15.—This was probably a case of cerebellar embolism. A girl aged 16, whom I had attended for chorea and endocarditis in 1922, had enjoyed fairly good health for over two years, and had worked as a housemaid during that period. On 11th November, 1924, I was urgently called at 5 p.m. to see her, and found her very breathless and cyanosed. The mother said she had had a cold for a few days. My diagnosis was " acute cardiac dilatation." The patient rallied, but at 9 p.m., in response to another urgent call, I found her in tetanic-like convulsions associated with opisthotonos—the cerebellar fits described in the text-books as associated with cerebellar lesions. The girl died five hours later. As I was attending at the time a large number of cases of influenza of a fairly severe type, I cannot help thinking that the " cold " from which the girl had suffered was influenza. The obvious diagnosis was " cerebellar embolism," and it is quite possible that the symptoms which I had put down to cardiac dilatation were due to a pulmonary embolism.

It will be seen that, of the nine cases related, an association with influenza was definite in Cases Nos. 7, 9, 10, 11 and 14, whilst influenza was prevalent at the time of occurrence of Cases Nos. 12, 13 and 15.

I do not propose, in this connection, to enter into such a controversial subject as to whether the so-called encephalitis lethargica is a post-influenzal condition. My very limited experience inclines me to the belief that it is. The most typical case of encephalitis of the choreiform variety which I have seen occurred at the height of the February—March, 1924, epidemic ; in another case, also of the choreiform variety, a medical friend of mine had suffered from an influenzal cold ten days before. The latter case—fortunately not fatal—was verified by a physician who has had a fair experience of the disease ; influenza was again very prevalent at the time of occurrence of this case. I will content

myself with asking others more qualified to judge if the symptoms of encephalitis lethargica would not fit in with a condition of thrombosis and embolism of the arteries of the basal ganglia. These are end-arteries, and this is the part of the brain most frequently affected.

Renal Embolism.—I have long been of opinion that many of the cases which we diagnose in general practice as "nephritis" — whether they be of the so-called *exudative* or *hæmorrhagic* types — are due to renal infarction. I have noticed recently that many other observers are of the same opinion, a fact which only occurred to me when I read the recent interesting article by Wyllie and Moncrieff[4] on "Acute hæmorrhagic nephritis in children." These observers draw attention to the well-recognized fact that the condition is often consecutive to an attack of "acute tonsillitis," and suggest, very rightly, I think, that it is due to renal embolism. I have seen many such cases follow on non-diphtheritic and non-scarlatinal sore throats in children (I saw at least three in the last quarter of 1925), but I have also seen the same condition follow on attacks of influenza in adults, so that the condition should not be labelled a special disease of childhood.

Now, renal infarction, it is well known, may occur in two forms. In the first blood is present in the urine in such quantity as to warrant the use of the labels "hæmaturia" or "hæmorrhagic nephritis;" in the second the clinical features may be those of an "exudative nephritis"—albumen being obviously present, whereas a microscopical examination may be needed to detect the presence of red-blood cells. To put it tersely in Sir Thomas Horder's words, "intermittent albuminuria should, therefore, suggest renal infarction just as intermittent hæmaturia does."[5]

Both types of cases are seen after influenza, as will be seen later. Moreover, as it is natural to expect if we believe the cases have an influenzal origin, one sees in practice little epidemics of nephritis which occur either during or immediately following the epidemics of what one has been in the habit of calling "tonsillar influenza."

As I am revising this section, I notice in the *British Medical Journal* of 11th December, 1926, four cases of "Acute hæmorrhagic nephritis following Influenza," reported by Cook. One of the cases was an adult. Whether one calls the cases influenzal or not makes no difference to their pathology; they are obviously of an infective origin. One rarely sees the old-fashioned type of "Bright's disease" in practice nowadays; most of the cases of nephritis seen are of the nature described above. The important characteristic of the cases—whether occurring in adults or children—is the excellent prognosis. I can remember but one case (No. 17) which failed to clear up promptly.

There is also a type of case following influenza in which the features are those of a pyelitis. It is probable, too, that these are the result of embolism with sepsis added. I am not confusing B. coli pyelitis with influenza, as the reader may be inclined to think. Whatever may be the predominating organism (and unfortunately one has not the time to classify these cases bacteriologically), there is here, also, a definite preceding sore throat with fever; moreover, the cases are seen generally during the influenza epidemics. The administration of potassium citrate leads to a speedy cure as a rule, and only rarely have I had to resort to vaccines.

All the cases described above occur during apparent convalescence from the influenza—after the patients

are up and about ; it is quite possible that, if I had not been in the habit of making careful notes, in many of the cases, the original illness might have been forgotten both by the patients and myself.

The embolic theory advanced as to the causation of the nephritis certainly receives support from the occurrence, in the same patient, of an obvious embolism in another organ, as in Cases Nos. 18 and 19.

I will now relate the histories of a few typical cases :—

Case No. 16.—G. T., male, aged 18, first seen on 24th May, 1926, for influenza, *i.e.* sore throat and fever. When convalescent he came to see me on the 31st, complaining of abdominal pain, and I noticed puffiness of the eyes. The urine contained a fair amount of albumen and red-blood cells microscopically. The patient was not particularly ill, would not stay in bed nor diet himself, but the urine was normal on 30th June, and the boy soon got well. He was previously healthy. This is an example of an uncomplicated case of the exudative type.

Case No. 17.—E. R. E., male, aged 45, was seen in my surgery on 24th December, 1925. Diagnosis: Influenza with sore throat and fever. I sent him home to bed, he had got better and walked about, but on 13th January, 1926, he came to see me complaining of swelling of his eyes and ankles, and brought his smoky urine for me to see. He was obviously suffering from nephritis. The urine contained a fair amount of albumen and blood. This man—a hard-working miner—has a dilated aorta, and possibly an atheromatous patch here may have furnished an embolus. The fact remains that there was a definitely observed infective factor in the attack of influenza preceding the nephritis. This man has been under observation for nearly a year, and the renal condition is not yet satisfactory. The man, however, was never of a robust type. This is the only case which I can remember that has not cleared up promptly. It is an example of the hæmorrhagic type in an adult. (1930.—The urine has been quite free for some time and he is working as a miner.)

Case No. 18.—This case is of unusual interest, inasmuch as a pulmonary infarction was observed after the development of the nephritis. Mrs. P., aged 39, and always healthy, was first seen with influenza on 29th October, 1925. She improved, but on 16th November I was asked to visit her again, and found she was suffering from " post-influenzal nephritis." On 22nd November, when the renal condition had much improved, I received an urgent message to see her, and found her in an alarming condition of dyspnœa and cyanosis. She complained of an agonizing pain in the chest. A well-marked pleural rub was heard on the 23rd, and on the 24th and following days she spat up very characteristic blood-sputa, which confirmed beyond all doubt our diagnosis of pulmonary infarction. The woman has no heart disease, and is now in good health, though she says she has occasional

pain over the region of the trouble last November. About this time I saw no less than six cases of post-influenzal nephritis.

Case No. 19.—In this case, also, a pulmonary infarction occurred after the nephritis. G. C., male, aged 28, was first seen on 15th February, 1926. He had the type of influenza with sore throat that was raging at the time (see Case No. 2). On 28th February his ear " burst " as the result of otitis media—a very common complication of influenza nowadays. On 13th March my note was " cardiac sounds soft and muffled ; swelling of face and eyes, which he says he first noticed on the 10th, after he had got up and about." The urine was now loaded with albumen and blood was present. On 20th March the urine was clear and remained so. He appeared at last to be getting better, but on 30th March he had an acute pain in the chest associated with fever and a pleural rub, and on 4th April he spat up the characteristic blood-sputa. He suffered later from a swelling of one hand and arm, which I thought must have been due to a peripheral embolism, but it must have been of a transient nature, as the swelling disappeared. The man was extremely weak and anæmic for some weeks, and I kept the possibility of malignant endocarditis in mind. The man improved, and is now working as a builder's labourer, and says he feels as fit as ever. I rather suspect, however, that his cardiac valves will trouble him at some future date.

If we assume the renal condition to have been embolic in the last two cases, we have here two examples of retrograde embolism.

Case No. 20.—H. E., a man aged 51, had a severe attack of influenza complicated by "pleurisy" at the latter end of December, 1920. On January 2nd, 1921, copious hæmaturia was observed. I attributed the hæmaturia to renal infarction, as further investigation failed to find any other cause for the bleeding. Possibly the "pleurisy" was due to pulmonary embolism. At the time I could find no definite evidence of heart disease, though I knew the man was never robust. It is interesting, therefore, to state that nearly six years later (September, 1926) the man began to show signs of cardiac failure, and I have now labelled him "myocarditis." It is curious that at the time of this man's illness I saw four probable cases of pulmonary infarction in twelve days. (see page 54) He is still (1930) not working, very short of breath.

Mesenteric Embolism.—The usual text-book description of mesenteric embolism concerns itself with an account of the complete blockage of the superior mesenteric artery—a condition generally occurring in a patient the subject of cardiac valvular disease, leading to gangrene of the intestine, and associated with an appalling mortality even if promptly treated by surgical measures. I am perfectly convinced, however, that

just as we get minor degrees of pulmonary embolism, so we sometimes have to deal with minor degrees of mesenteric embolism. Now, there is a fascinating and puzzling group of cases occurring during influenza in which pain, generally in the right iliac fossa, vomiting, often fæculent, distension of the abdomen, and fever, may lead one to suspect acute appendicitis or even intestinal obstruction; there is, however, something lacking in the clinical entity, we stay our hand and find that the patient recovers without operation, though not without a good deal of abdominal distension and discomfort which may last for weeks, and which I believe are due to abdominal adhesions. These cases do not seem to me to be explained satisfactorily by the term "influenzal typhlitis" often used in this connection. It is my firm belief that the symptoms in these cases are due to a mild degree of mesenteric infarction. The clot may be a soft one that breaks up easily so that its particles pass on, or a small one, so that the circulation gets re-established and thus no gangrene of the intestine occurs; in the meantime, however, the infarction has caused a sufficient degree of ileus (consequent on the intestinal anæmia) to alarm the observer. I take it that the freedom of anastomotic communication varies in different people, and that while the freedom of communication is fairly complete in most mesenteries, end-arteries exist in this situation in some bodies. The freedom of communication of the vessels of the lower end of the large intestine is never as complete as that of the vessels higher up. A small clot may cause only some exudative roughening of a limited portion of intestinal peritoneum with perhaps some localized adhesions and a more or less early return to normal; a larger infarct may cause a small patch of gangrene which may perforate if it is not covered over

with a protective pad of omentum. If the clot is a large one, we get the classical symptoms and signs of thrombosis and embolism of the mesenteric artery—a condition so rarely seen that it would be difficult to ascertain whether the pathologists see it more often during the influenza seasons. While patients with valvular disease are naturally more prone to the above accidents, I fail to see why they cannot, like other varieties of infarction, occur in healthy subjects.

The following cases illustrate the occurrence of peculiar and puzzling abdominal symptoms during influenza :—

Case No. 21.—W. T., a man aged 48, with " myocarditis " of some years' duration, was seen with peculiar pulmonary symptoms and signs on 10th March, 1919. Influenza was epidemic at the time, but I did not label him " influenza," as I had the cardiac condition in mind. On 21st March he presented symptoms suggestive of intestinal obstruction. He was an impossible subject for an operation, and he died on 1st April. I was much puzzled by the case at the time, as also was a colleague who saw the case with me. Looking back, however, in the light of subsequent experience, it seems clear that the lung condition was one of infarction, and that the abdominal condition was one of mesenteric embolism. I discovered some time afterwards, whilst engaged in my investigation, that I had attended other cases of embolism during this epidemic. It is difficult at these busy seasons to think coherently. It is the calm survey after which is often so illuminating

Case No. 22.—B. J., a healthy woman aged 24, was first seen on 11th February, 1919, at the onset of an influenza epidemic. Severe, protracted bronchitis followed the influenza. The patient went rapidly downhill, with a septicæmic condition, and on 13th March severe abdominal pain was associated with a lump in the abdomen and peritonitis. Operation was declined, and the patient died on the 14th. I was much puzzled by this case, which I had reported to the Medical Officer of Health as a possible case of enteric. The parents—peculiarly stubborn people—had refused to allow me to take a sample of blood. Though all the illness had resembled a severe case of influenza, and though the latter was epidemic at the time, the presence of an abdominal lump had puzzled me, and made me think of perforation of a typhoid ulcer. I believe now that the lump was due to a mesenteric embolism. Horder,[5] in his interesting lectures on endocarditis, describes what appears to be a similar case. The difficulties of diagnosis—even to the expert—are apparent from his remarks that " despite the unusually discreet nature of the lump . . . the case would doubtless have been considered one of acute appendicitis, had it not been that . . . the patient became suspect on the score of a possible septic endocarditis."

Case No. 23.—M. D., a robust woman aged 46 (who, however, has a child with congenital syphilis), had an attack of influenza and tonsillitis on 9th April, 1925, and during the attack she developed abdominal symptoms which much puzzled a locum who was helping me at the time. The case resembled a case of acute appendicitis with much distension, but owing to the attack of influenza I thought it a case of embolism, and the patient got well without operation. It is interesting to note that this woman had fractured her tibia on 19th February, about fifty days before her influenza; possibly a clot was detached from the leg. Why, in this case, however, was the event noticed during the attack of influenza, or had the fracture anything to do with it? The following July I had occasion to open the abdomen for the performance of a long-contemplated ventral suspension, and took the opportunity afforded of inspecting the appendix, mesentery and intestine. The appendix was normal and free of adhesions, the mesentery was unduly thickened in parts, and the intestines were mottled with greyish-white patches—recent, and evidently the remains of peritonitis. There were also several recent adhesions between various parts of the small intestine. I think that the whole condition was due to the attack of abdominal influenza in May.

The following case, unconnected with influenza, I looked upon as an infective endocarditis with embolic features:—

Case No. 24.—H. W., a man aged 38, who had always been healthy, but who had suffered from syphilis in 1918, began to show indefinite signs of failing health in July, 1925. The nearest approach to a diagnosis that I could get was a label of "cardiac dilatation." No murmurs were heard. On 14th September gallop-rhythm was observed. After a period of going downhill he was taken on 31st October with abdominal pain and fæculent vomiting—a condition resembling a subacute obstruction. I came to the conclusion that the case was one of endocarditis of probable specific origin, and that the abdominal symptoms were probably due to small mesenteric emboli. The latter suggestion received support a few days later, as on 2nd November a pain in the chest was accompanied by a pleural rub, on 4th November some bloody sputum was expectorated, and two days later about half an ounce of pure pus was voided. The patient died in a toxic state on 8th November. It would seem that here a pulmonary embolism followed a mesenteric embolism.

There is some support for my theory of a minor degree of mesenteric embolism. Maingot[6] recently reported a case of perforation of the jejunum following what was called a lobar pneumonia, and in which he successfully operated. I was interested to see that he attributed the perforation to a "septic infarct" of the intestine. This case occurred in November, 1924, when influenza was very prevalent. Mr. Maingot has kindly

informed me that he has had a similar successful case since ; in this case a perforation occurred in the intestine of a child after an attack of influenzal bronchitis. I also operated on a child in the 1918 epidemic for infarction of the intestine.

With regard to the infarcts being septic, I think that most of the emboli of which one sees the effect during influenza must be of what the pathologists call a bland (aseptic) nature, and sepsis as we usually understand it, *i.e.* the formation of pus, is not necessary for their initiation. Occasionally we get septic infarcts —Cases Nos. 3 and 24 are examples. I saw also in May, 1925, when influenza of a severe type was raging in my practice, a case of pulmonary abscess in a child, which I think was originally due to a central pulmonary embolism, the latter being diagnosed as influenzal pneumonia.

I may add that no melæna was observed in any of the cases described above as probable mesenteric embolisms. It probably needs a large area of intestine to be involved, or the erosion of a large vessel, to cause this symptom. Possibly, some of the melæna which we observed frequently in the November, 1918, epidemic, was caused in this way. The following case seemed to be an instance of an erosion of a large vessel in the intestine by an infarct :—

Case No. 25.—W. E., aged 40, had a severe internal hæmorrhage on 13th June, 1925. This was followed by melæna on the 15th. An X-ray of the stomach gave no illumination as to the cause of the trouble ; an exploratory operation on 7th December showed two healed rounded patches in the third part of the duodenum—recent, and evidently the cause of the hæmorrhage in June. They were, I think, healed infarcts. It is possible that many duodenal ulcers originate in this way. This man has a dilated heart with no murmurs—there is probably endocarditis present. He has left the district.

Splenic Embolism.—I can remember only one case of splenic embolism associated with influenza, Case No. 14.

Coronary Embolism.—It is well known that sudden and complete blockage of a coronary artery is a common cause of sudden death. We were all taught as students the effect of gradual blockage—an area of infarction in the cardiac wall followed by scarring and a condition of fibrous myocarditis. I doubt, however, if we general practitioners have kept the latter process sufficiently in mind. We see very many cases of "weak heart"—many of them following the infections, and our usual label of "myocarditis," though a pretty accurate one, becomes so habitual that we are inclined to forget that here again the process of embolism is the most important in the ætiology. Thanks, however, to the recent work of certain observers, notably Gibson,[7] Coombs and Hadfield,[8] the subject has once again been emphasized to us. Gibson is at pains to point out that what he calls "ischæmic necrosis of the heart muscle" (cardiac infarction) is not only a cause of sudden death and angina pectoris, but is an important cause of chronic heart failure also. He states, indeed, that "chronic cardiac failure in old people in the absence of syphilis, old rheumatic affections of the heart, and pernicious anæmia, is almost certainly due to ischæmic necrosis," and that "chronic cardiac failure plus evidence of aseptic embolism makes the diagnosis of ischæmic necrosis practically certain." I have no hesitation, as a general practitioner relying only on clinical evidence without the support of post-mortem evidence, in fully agreeing with these two sound statements. Case No. 13—the woman with "myocarditis," who developed a cerebral embolism—was a typical example of ischæmic necrosis. There was no sign of rheumatism or syphilis in her case. A more dramatic instance of ischæmic necrosis was the following:—

Case No. 26.—M. M., a woman aged 55, had always been exceptionally healthy, and the only attendance I had given her in eight years was for a Colles' fracture. I first saw her on 28th September, 1925, for what I took to be a disordered action of the heart of functional origin, and thought very little of the matter. On 15th October, when I was sent for, I was horrified to find her in bed with œdema up to the waist, and with a large pulmonary infarct. After some slight improvement she fell back dead in bed on 7th November. The duration of the case was thus only forty-one days. I could elicit no history of a cold or influenza, though there was a good deal of the latter about at the time.

We probably see in practice, also, cases of coronary infarction which, though causing alarming symptoms, are not immediately fatal. They are analogous to the cases of pulmonary infarction which I have described on pages 34 and 35. The following is an example:—

Case No. 27.—Early this year (1926), D. J., a man aged 67, in failing health since he had an attack of influenza with severe delirium in 1923, came to my surgery gasping for breath, and with severe precordial pain. He had been suffering from a "bad cold" for a few days. He was ashy-pale, and on examination his heart was fluttering, and there was a marked pericardial rub, which latter was probably the outward sign of a cardiac infarct. I sent the patient home to die, as I thought, but, to my surprise, he got better, and is now walking about much improved in health. It would not surprise me, however, if he drops down dead at any time; it is well known that a patient may live for years after a cardiac infarction.

I had been of opinion, long before I read of Gibson's and Coombs' work, that, just as some of the sudden deaths after influenza are probably due to pulmonary infarction, so also a certain proportion are probably due to coronary infarction. If pulmonary infarction in its minor forms is such a characteristic of influenza—a fact of which there is no shadow of doubt, as the physical signs are near the surface and can be recognized—it is only reasonable to suppose that infarction occurs in other situations as well, and I think I have given sufficient evidence of this already. Owing, however, to other organs than the lung being deeper down and, so to speak, out of our clinical "reach," it is less easy for us to be dogmatic in our interpretation of the symptoms

and signs produced, and unfortunately the general practitioner, though often convinced in his own mind, is denied the post-mortem.

It is interesting to note that the youngest of Gibson's patients—a woman of 25—died after an attack of influenza. Death was sudden, and the post-mortem disclosed "thrombosis of the pelvic veins and an embolus of a coronary artery." It is significant, too, that of the three cases described by Coombs one was said to have had influenza and another influenzal pneumonia.

The sudden deaths from coronary embolism which we may assume to occur after influenza, though more prone to occur in the subjects of old heart or arterial trouble, may quite well—by analogy with our other cases of systemic embolism — occur in healthy and robust subjects. I suspect that if post-mortems were the rule in general practice, we would find that coronary embolism is far commoner than we think. The following are but three cases of sudden death after influenza, most probably due to the above cause :—

Case No. 28.—W. W., male, aged 48, an exceptionally healthy colliery official, was attended by me for what appeared to be a mild attack of influenza in the severe January–February, 1922, epidemic. He returned to work without consulting me (though I would probably have given my consent), his wife said he had felt quite fit, but he died suddenly in the pit on the day of resumption.

Case No. 29.—J. D., aged 64, arteriosclerotic, had an attack of influenza in February, 1925, when influenza was epidemic. He appeared to improve, I had not seen him for a week, but I was urgently sent for on 27th February. After retiring for the night, he had sat up in bed, gasped and become livid, and had died before I arrived, a few moments after being sent for.

Case No. 30.—H. J. F., male, aged 55, whom I had known for eight years, and who had consulted me for only trivial complaints, came to see me in May, 1926. He told me he had had "a dose of 'flu which he thought he could cure himself," but had been "aching all over since." I took it to be a case of post-influenzal myalgia—a very common complaint nowadays. A few weeks later there were signs of cardiac dilatation, and it was this label that I used when I signed the man "on his club." Later still there were severe pains in the

epigastrium which, at first, I thought might be due to the aspirin which the man had been taking. When, however, jaundice was observed, in spite of the fact that I saw several cases of jaundice at this time, I thought that there might be a local trouble, such as gall-stones, to account for the abdominal symptoms. An X-ray of the stomach and other investigations were of no help. I believe I would have recommended a laparotomy, had it not been that I was rather dubious as to the cardiac condition. Though the man made little progress, he was able to walk about. When I was away on my holiday in August my assistant was sent for in a hurry one morning, but the patient was dead when he arrived. I think that there was no doubt that the case was one of ischæmic necrosis, and that the jaundice was but a sign of a hæmolytic process associated with the influenza from which the patient had evidently suffered (see Cases Nos. 1 and 2). Gibson, in his article, refers to these cases with symptoms referred to the abdomen.

One could quote many similar cases; my death certificate counterfoils show—and probably those of other general practitioners do also—that a majority of my "cardiac" and arteriosclerotic patients have died during the influenza seasons, most of them suddenly.

Peripheral Embolism.—I have personally seen no definite example of the lodgment of an embolus in an artery of a limb, though I suspected a transient embolism of this sort in Case No. 19. A friend of mine, in practice near, tells me of a case of his in which during convalescence from influenza a middle-aged patient developed a cerebral embolism which was followed by bilateral gangrene of the legs, most probably the result of blockage by emboli. I saw, a few months ago, several patients convalescent from acute tonsillitis, in whom slightly-raised bluish-red patches appeared over the fronts of the legs. This condition, which appeared to be of the nature of erythema nodosum, is probably due to emboli in the minute vessels of the skin. I noticed that several of these cases were reported in the medical journals at the time.

Owing to its position and characteristic symptoms and signs, the peripheral embolism should be easy to

diagnose, and it is of interest to state that, in spite of its superficial position, operations for the removal of the embolus have not been very successful, as, so far as I can find, only one successful case has been reported in this country, and that by Jefferson[9] as recently as April, 1925. Here an embolism of the brachial artery followed an operation for umbilical hernia. No heart disease was detected, and the patient was healthy. In this case an infarction of the lung followed the peripheral embolism. Mr. Jefferson has kindly informed me that there was no history of influenza in his case, but it is interesting to add that influenza was prevalent at the time of the occurrence.

General considerations.—It will be noticed that I have described a fair number of cases of embolism (and I have notes of many more) in which a definite attack of influenza was antecedent. If, as I hope, I have proved to the reader's satisfaction that influenza is often the predisposing cause of infarction, it is but natural to suppose that this is sometimes a seasonal phenomenon, and I have found, far too often for the matter to be considered a coincidence, that "runs" of embolism—or embolic cases—are encountered in general practice. It is true that one sees also cases of embolism in which no apparent history of "cold" or influenza is forthcoming, but as such cases occur in close chronological proximity to other manifestly influenzal embolisms, is it unreasonable to suppose that the blood condition—if such there be—which led up to the embolic event might be the only influenzal manifestation—just as, for example, a neuritis may be? One must allow, too, for the short memories of one's patients. What they may look upon as "a bit of a cold," and forget about soon, may, nevertheless, be influenza, and fraught with grave possibilities

later. Not so long ago a doctor friend of mine with encephalitis lethargica, forgot all about the "touch of 'flu" which I remember he had casually mentioned to me over the telephone about ten days previous to the onset of the choreiform movements. What, therefore, can one expect of a layman ?

Here are three examples of a "run" of cases of my own in which the symptoms were very probably of embolic origin :—

1. During the March, 1919, influenza epidemic I saw:

(*a*) A case of pulmonary infarction in a pregnant woman of 23, who was suffering from influenza on the 9th.

(*b*) A case of influenza with "jam-sputum," on the 12th. This case, a boy aged 16, at the time was suspected of phthisis and attended a clinic. No bacilli were found. Patient alive and well.

(*c*) Case No. 22.—Mesenteric embolism on the 13th.

(*d*) Case No. 7.—Cerebral embolism on the 14th.

(*e*) Case No. 21.—Mesenteric embolism on the 21st. The initial symptoms of this case on the 10th were probably due to pulmonary infarction.

That is, five cases were seen in thirteen days.

2. At the end of 1920 and beginning of 1921 I saw:

(*a*) A healthy woman who, on the sixth day of an aseptic puerperium, was taken suddenly ill with marked dyspnœa and cyanosis on 22nd December, 1920. The initial label was "? heart or embolism."

(*b*) On 23rd December, 1920, I diagnosed a case (a young child) "larval pneumonia."

(*c*) A man aged 30 with a typical pulmonary infarction on 27th December, 1920.

(*d*) A healthy boy aged 15, who during an attack of influenza showed signs of what I diagnosed as "acute cardiac dilatation."

(*e*) Case No. 20, who had hæmaturia on 2nd January, 1921 (following influenza and pleurisy).

Here five cases were seen in twelve days.

3. Between 30th August and 17th September, 1925—a period of nineteen days—I saw:

(*a*) Case No. 6.—Fatal pulmonary embolism, on 30th August.

(*b*) A case of pulmonary infarction after operation on 7th September. I operated on this healthy man, aged 24, (hernia) on 3rd September. I found out afterwards that he had had "a cold" before admission to hospital.

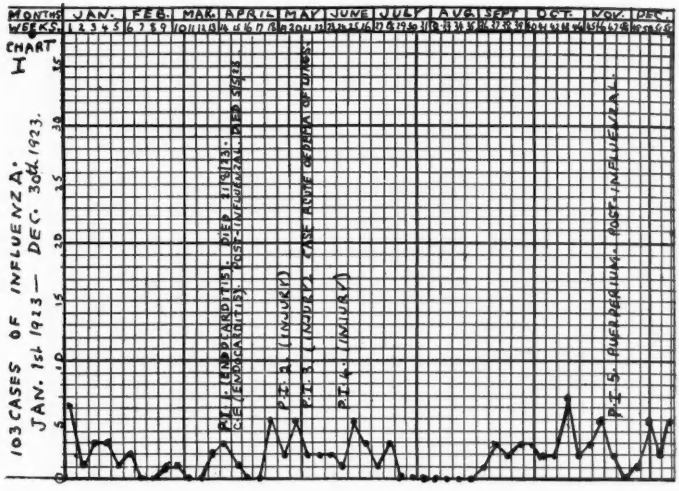
(*c*) Case No. 13.—Cerebral embolism on 12th September.

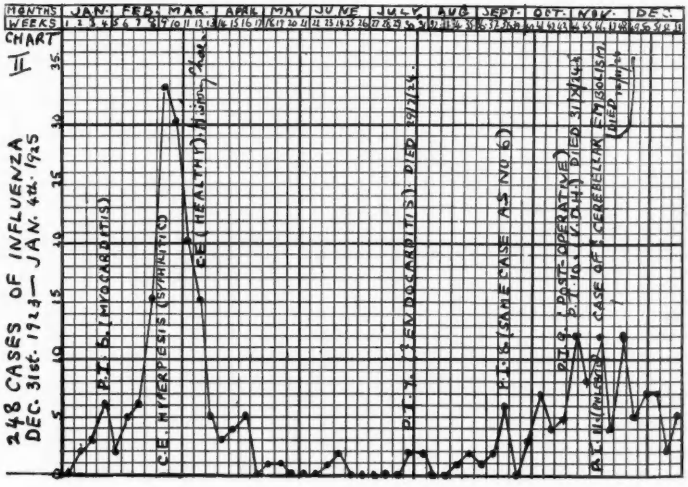
(*d*) Case No. 14.—Cerebral embolism on 17th September.

I had seen nothing like a case of embolism since the preceding May. In this month (when influenza was epidemic here) I saw Case No. 12 on the 9th (cerebral embolism), a case of influenzal pulmonary infarction on the 31st, and a young boy whom I had diagnosed as a central influenzal pneumonia; a pulmonary abscess followed, and death from septic embolism of the brain; it is practically certain that the case was originally a central pulmonary embolism.

One could give further examples if one wished to become wearisome. I cannot believe that we are dealing with an extraordinary series of coincidences in the events related above.

The charts show the incidence of influenza in my practice from January, 1923, to June, 1927. The


MONTHS
JAN. FEB. MAR. APRIL MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
WEEKS
CHART I
103 CASES OF INFLUENZA.
JAN. 1st 1923 — DEC. 30th. 1923.
P.I. 1. (ENDOCARDITIS. DIED 1/9/23.
C.E. (ENCEPHALITIS) POST-INFLUENZAL. DIED 5/5/23.
P.I. 2. (INJURY)
P.I. 3. (INJURY) CASE ALONE OF DEATH OF TWINS.
P.I. 4. (INJURY)
P.I. 5. (INFLUENZAL)


MONTHS
JAN. FEB. MAR. APRIL MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
WEEKS
CHART II
248 CASES OF INFLUENZA
DEC. 31st. 1923 — JAN. 4th. 1925
P.I. 1. (MYOCARDITIS)
C.E. (HYPNOTIC)
C.E. (HEALTHY)
P.I. 2. (ENDOCARDITIS) DIED 19/2/24.
P.I. 3. (SAME CASE AS NO 6)
P.I. 4. (POST-OPERATIVE)
P.I. 5. (INJURY) DIED 31/1/24.
P.I. (ILLNESS) CASE OF CEREBELLAR ET 7 DIED 15/2/24.

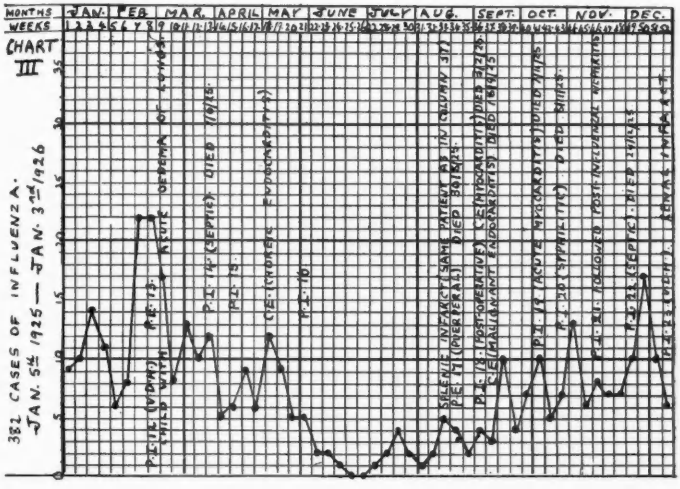


CHART III
381 CASES OF INFLUENZA.
JAN. 5TH 1925 — JAN. 3RD 1926
MONTHS
JAN. FEB. MAR. APRIL MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
WEEKS

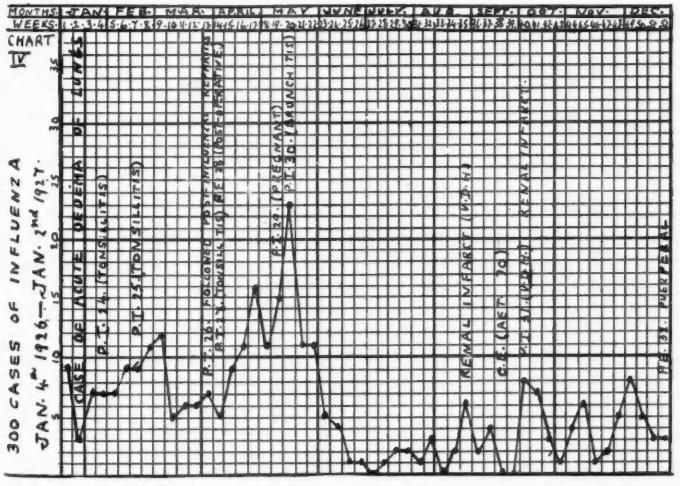
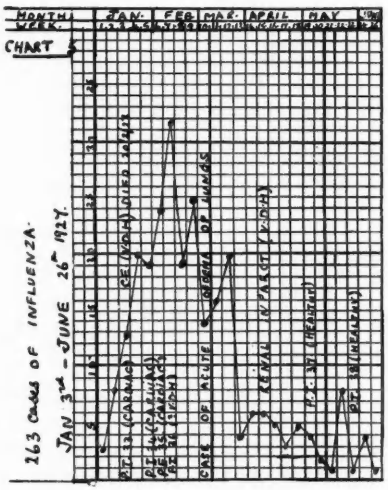


CHART IV
300 CASES OF INFLUENZA
JAN. 4TH 1926 — JAN. 2ND 1927.
MONTHS
JAN. FEB. MAR. APRIL MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
WEEKS



vertical columns are the weekly periods (1 to 52) when my books are made up. Inserted in them are the numbers of *fresh* cases of influenza *visited* weekly—thus forming the curves. Inserted in them also—in the weeks appropriate to their dates of occurrence—are the cases of pulmonary infarction (P. I.), pulmonary embolism (P. E.), cerebral embolism (C. E.), " ? cerebellar embolism," renal infarction, acute œdema of lungs, etc. I think it will be admitted that the charts show that the occurrence of embolism coincides with the prevalence of influenza. Cases of coronary embolism have been excluded, as the diagnosis of this condition is more open to doubt.

A question I think I may be entitled to ask, in view of the foregoing, is: Are the cases of embolism—pulmonary or systemic—which occur after operation, and which have been so freely discussed by surgeons of late years, due to the operation *per se*, or is some other factor at work? The usually accepted sequence in these cases is something like this: operation—sepsis—

venous thrombosis—embolism. The word sepsis is an unfortunate one in this connection, as it makes one think of pus, and it is well known that embolism may occur even when the wound has healed by first intention and there is no sign of pus elsewhere. Would not the term infection be more desirable, and is it necessary that the infection be carried by the surgeon's hand ? Might not the infection be present in the patient before operation ? I remember well, when resident in a large hospital, a patient with chronic appendicitis dying of pulmonary embolism on the day before that fixed for operation. A pulmonary embolus was found at autopsy, and there was no pus anywhere. Indeed, I would be so bold as to ask, if the post-operative embolism, in many more cases than we imagine, is not merely a coincidence. Operations are always being performed ; some of them must take place when, to use a tentative expression, "embolism is in the air," and we will thus always have a certain proportion of operations followed by embolism. As I have endeavoured to show, embolism is fairly common in healthy persons apart from operation, and Lindsay[2] has drawn attention to Rupp's figures as showing that "the mortality from pulmonary embolism in internal disease without operation worked out at 1·1 per cent., that is, four times as great as that following operation."

I suspect that of all the contributors to the discussion on post-operative pulmonary embolism at the Royal Society of Medicine on 4th February, 1925, Featherstone[10] came nearest the truth when he "attributed great importance to an epidemic, such as of influenza or ordinary colds, in the causation of post-operative pulmonary conditions."

I have already mentioned, when speaking of the seasonal incidence of embolism, a case of pulmonary

infarction following operation which occurred in September, 1925, within a few days of the occurrence of other cases of embolism in patients on whom no operation had been performed. During February and March, 1923, I had a large number of cases of influenza, in which the chief features were tonsillitis and a tendency to embolism during apparent convalescence. Several of these cases have been described. One can surely say at such a time that "embolism is about," and assume that the operation case is exposed to risk of embolism at the same season. The following case may be taken as an example :—

Case No. 31.—I operated on Mrs. W., a rather obese woman with a fatty heart, for a twisted ovarian cyst on 27th March, 1926. Operation was performed twelve hours after the onset of the symptoms, was attended with no difficulty, and in the ordinary way the prognosis would have been excellent. On account, however, of the patient's heart, and of the embolic cases I had seen at the time, I actually warned the relatives that there was a risk that a "clot of blood" might pass to the lung. Surely enough, on 8th April—twelve days after operation—the patient was taken ill with an acute pain in the chest, and was so cyanosed and pulseless that the sister in charge thought she would surely die. She rallied, however, brought up some blood-stained sputum later, appeared to improve, but on 28th April—a month after operation—she died with similar symptoms referred to the other side of the chest. It is only fair to add that some sepsis had occurred in the wound. I could not, however, dismiss from my mind the other cases of pulmonary infarction I had seen at the time.

There has been some discussion lately as to whether the post-operative embolisms are more common relatively than they used to be. While some observers state that their frequency has not increased, Gordon-Watson[11] is of the opposite opinion, and he shows that at St. Bartholomew's Hospital for the three years before the war the surgical deaths from pulmonary embolism were 0·5 per cent., for three years after the war they were 1·7 per cent., and in the next two years 2·9 per cent. I attribute this to the increased incidence of influenza during the latter periods. Thus, during the three years after the war, my records show that I

visited 243 cases which were labelled influenza, and in the next two years 481 cases. One has only to con the medical journals to note in the last two years an increased reporting of cases of embolism, some of them even after operations for cataract. Even in the newspapers one is constantly reading of the accounts of inquests in which "a clot of blood" somewhere is said to the cause of death.

Though, as I have shown, infection must play a great part in the production of embolism, speculation is still rife as to the exact mechanism by which the latter is brought about. In pulmonary embolism the embolus must be derived from a clot in one of the systemic veins (generally those of the pelvis or lower limbs), in the right heart, or in the pulmonary artery itself; in systemic embolism the embolus is derived from a clot in the pulmonary veins, in the left heart, or possibly in the aorta. It is only when the thrombus occurs in one of the comparatively superficial veins that it can be detected by examination. Now, though thrombosis in the veins of the lower limbs is such a well-mentioned complication of influenza, it is extraordinary that in not a single case of pulmonary infarction detailed above was I able to detect any sign of phlebitis in the lower limbs. In fact, I can remember only one case of pulmonary infarction where I was able to satisfy myself of the presence of such phlebitis. On the other hand, Whittingdale [1 2] reports seeing in the twelve months preceding March, 1926, a large number of cases of phlebitis of the lower limbs with a "large proportion of pulmonary infarcts," and in one case "multiple cerebral emboli," and he asks tentatively if other observers have had the same experience. I have no doubt that his cases, occurring in a period I have also found characterized by a

marked increase in the number of embolic cases seen, bear an ætiological relationship to the cases I have described, but it is curious that the manifest evidence of thrombosis was missing in my cases. Probably the large veins of the pelvis are the source of the clots in the majority of cases; this was so in the only case of mine that came to autopsy. In the cases that follow operation Lockhart-Mummery is probably correct when he says that the site of operation is by no means invariably the source of the embolus.

How are we to explain the systemic embolisms? Those which occur in the subjects of obvious heart disease are easy enough to explain. What of the systemic embolism that occurs in the previously healthy subject? Is it due, in influenza, for instance, to a recently-acquired acute endocarditis which is not recognizable clinically? This theory will explain, probably, such cases as Nos. 19, 22 and 3. I am well aware that the recognition of an acute endocarditis is often a very difficult matter, but against this supposition in many of the cases is the fact that the patients get better rapidly and apparently permanently, a history hardly suggestive of an acute or malignant endocarditis. It seems to me—I speak with due humility—that the pulmonary veins must be an important source of the systemic embolisms in healthy patients. I had long conceived such a thrombosis as accounting for the curious physical signs met with in the chests of influenzal patients, before I found that Glynn[13] had placed pulmonary thrombosis on a sound scientific footing. The latter, indeed, goes so far as to say that what we call pulmonary embolism is really primary thrombosis in the pulmonary arteries. I fail to see why thrombosis should not likewise occur in the pulmonary veins, and thus furnish us with our systemic

embolus in a certain proportion of the cases. We must, surely, have recourse to the theory of an increased coagulability of the blood; Almroth Wright, years ago, showed this to exist after influenza. If the germs associated with influenza and acute tonsillitis can cause jaundice (see Cases Nos. 1, 2 and 30) of hæmatogenous origin, it is not unlikely that a change in coagulability of the blood can be brought about by the same agency. The increased-coagulability theory will clear up many discrepancies; it will account for the occurrence of the pulmonary, the systemic, and the so-called paradoxical embolisms. The word paradoxical, used in this connection, could thus be abolished. Is there invariable proof that, when more than one variety of embolism occurs in the same patient, they are both due to the same embolus or to emboli coming from the same source? Is it not possible with such an increased coagulability of the blood that after the occurrence, say, of a pulmonary embolism a systemic embolism may be caused by a fresh embolus formed in another situation, and vice versa?

I have no doubt that many of my readers will approach this essay in a spirit of scepticism, and may think that I have enthusiastically carried my conclusions farther than the evidence warrants. I am, however, very convinced of the truth of my statements. Unfortunately, the general practitioner has only his clinical instinct to guide him, as he rarely has a post-mortem to confirm or refute his suspicions. On the other hand, a majority of the cases do not die, and the interpretation of the symptoms and signs is always a matter of conjecture. Besides, the post-mortems at the large hospitals, though the most valuable help we have at present, form but a tithe of the fatal cases throughout the country; much interesting material

must, therefore, needs be missed. I find, however, that there is scientific proof of the occurrence of thrombosis and pulmonary embolism during influenza. Holtinger[14] in a recent interesting study entitled "Influenza and its complications in young children," described four cases of cerebral sinus thrombosis. It is interesting to me to note that in one of the cases (age 2½ years) "embolisms were found in the left pulmonary arteries with an extensive infarct of the left lower lobe" and in another (age 19 months) "embolism of the right pulmonary artery." I have no doubt that most of us general practitioners have seen many similar cases, and have diagnosed them as "pneumonia." In addition, the Medical Registrar of one of the large London hospitals, Alan Moncrieff, in June, 1926, kindly wrote to inform me that he had seen "in the last six months three cases of pulmonary infarction all with autopsies." One of the cases followed a "white leg," the other two followed influenza, and were diagnosed as "influenzal pneumonia" during life; in both of them the embolus was derived from a thrombus in the pelvic veins.

I venture to think that an inquiry by all the large London and provincial hospitals into the incidence of all cases of embolism—without regard to whether they were medical or surgical, and with a note as to the time of their occurrence—would be productive of information of real value, and would probably bear out my theory of a "seasonal incidence of embolism," the seasons closely corresponding to the waves of influenza which are so frequently observed in general practice since the visitation of 1918.

Prognosis.—The prognosis in these cases of embolism, occurring as they do sometimes in healthy people, is by no means invariably unfavourable. While, of course, the occurrence of a minor pulmonary

embolism makes one bear in mind the possibility of a subsequent fatal massive embolism, we are fortunately spared this in the great majority of the cases. Case No. 31 is an example, where a fatal embolism followed a non-fatal infarction. Generally speaking, the prognosis depends upon :—

1. *The previous history of the patient.*—Naturally one's prognosis is guarded in "cardiac" and arterio-sclerotic subjects but, as will be seen by the histories of Cases Nos. 7 and 10, recovery may follow and the patients may live for years afterwards. Probably the embolus is a soft one in such cases.

2. *The size of the embolus.*—The larger the embolus the more likely is an immediately fatal result to ensue (in the pulmonary artery for instance), or irreparable damage to be done (in such an organ as the brain). With a smaller embolus, though alarming symptoms may at first be noted, re-establishment of the circulation may soon take place, and recovery may be astonishingly complete. It is in the lung that we can best observe the effect of different-sized emboli, as the symptoms and signs are less equivocal than in other regions.

3. *The nature of the embolus.*

(*a*) A septic embolus is likely to lead to pyæmia. Case No. 3 is a typical example of this kind. Fortunately, the septic embolus is rarer than the bland embolus.

(*b*) A soft or friable embolus may, almost immediately after causing alarming symptoms, break up into minute particles which pass on into the circulation, and recovery may be astonishingly complete. Only thus can one explain the amazing improvement seen in some of the cases in which embolism seems to be the only reasonable diagnosis. These "transient" embolisms, to use Osler's expression, are, I am sure, much commoner than we think.

The prognosis, anyway, in these cases, is much better than it used to be in the cases which one saw twelve or more years ago. At that time to get a "stroke" meant, in most cases, an inevitable paralysis to follow. Nowadays one can give the patient some cheer. The following most recent case of mine is an example of what I mean:—

Case No. 32.—J. H. P., a man aged 70, whose history was free from any previous serious complaint, and who was a remarkably active man for his years, felt all "one-sided" when doing a round of golf one day. He got back to his hotel, and woke up the next morning to discover that he had completely lost the use of his left upper limb. There was some weakness also in the lower limb, but he was able to move this. He came home, and when I saw him there was complete paralysis in his left arm. The heart action was rather feeble, but there was nothing else unfavourable. I told his wife and son—the latter a medical man—that there was quite a sporting chance of a great improvement. The stroke took place in the middle of September, 1926. A great improvement took place, and when I saw him last, on 18th December, I found him rolling his tobacco in an expert manner, with a strong grip and with almost normal movements in his arm. His son agreed with me that a thrombosis or embolism must have been the cause of the symptoms. Still well (1928). Had another attack, 1929, affecting speech.

Of the 32 numbered cases above 15 are now dead; Case No. 7 had lived for four years after the embolism. Of the deaths, 5 were due to pulmonary embolism, 7 to systemic embolism, whilst there was probably a mixed embolism in 3 of the cases. The list, however, is chosen at random, and contains a large proportion of fatal cases, as these are more liable to impress themselves on one's memory. As yet I have not had the time to make an exhaustive list of the cases.

Treatment.—This does not make a long story. The bold measure of opening the chest—as has been done on the continent—to remove a large pulmonary embolus is merely of academic interest to most of us. The removal of an embolus from the artery of a limb is a more feasible proposition, yet difficulties in

technique have prevented this from being a very successful operation. On the theory of an increased coagulability of the blood in influenza and other infections the routine administration of the citrates in these diseases would seem a rational therapeutic measure. Is this the reason why the exhibition of potassium citrate is attended by such good results in cases of post-influenzal nephritis, or is it because it renders the urine alkaline ?

Are there any means by which we can prevent these embolic events ? I doubt it. Some surgeons, for example, say that we keep our patients too quiet after operation, and thus allow blood to stagnate—and clot—in their veins. I even have read somewhere that it is the placid type of patient who is liable to embolism. As a matter of fact, this is directly opposite to my own experience, that it is the restless, excitable patient who is liable to this complication. On the other hand, we are taught that if a patient has a thrombus anywhere he must be kept quiet for fear of dislodging the clot. How are we to choose the right path ? How are we to distinguish the pre-clot stage from the clot stage, especially as most of the clots that form are—in the pelvis—hidden and out of sight ? Some surgeons even attach importance to the method by which we tie our pedicles, as being a factor in the occurrence of post-operative embolism. One thing only can I say with any conviction. Infection is the most important factor in the ætiology of embolism, and thus no operations but the most urgent should be performed during the influenza seasons. Probably the only way in which we will, to any extent, prevent the occurrence of embolism will be by the prevention of influenza and other allied infections—a consummation, indeed, devoutly to be wished.

CONCLUSIONS.

1. Influenza, like the other infectious diseases, is often the predisposing cause of all varieties of embolism.

2. Influenza is increasingly prevalent since the advent of the 1918 epidemics, and embolism is more commonly observed than formerly.

3. The embolism, though often occurring in the subjects of heart disease, occurs not infrequently in healthy and robust subjects.

4. The explanation which will account for the occurrence of embolism in healthy subjects and also for *all* varieties of embolism—pulmonary, systemic, and so-called paradoxical—is an increased coagulability of the blood.

5. The post-operative embolisms, whether pulmonary or systemic, are in many cases of a similar nature to the influenzal, and there is good reason for stating that they occur at the same seasons and that their numerical incidence varies directly with the prevalence of influenza.

6. Thrombosis in the pulmonary veins is probably an important factor in the production of systemic emboli which occur in patients with sound hearts.

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Reviews of Books

Through the States with a Seeing Eye. By R. J. A. Berry, M.D., F.R.C.S., F.R.S. Pp. 200. Illustrated. Bristol: John Wright & Sons Ltd. 1930. Price 5s.—This is a most entertaining little book and makes one long to know the author, a longing which every Bristol man can now gratify as Dr. Berry has taken up his residence among us and the appointment of Medical Superintendent of the Stoke Park Colony. The author was one of a deputation sent from Australia to America to investigate matters relating to hospitals, medical education and universities. On his return to Australia he was asked to broadcast his impressions of the States. This he did in twenty-five talks which constitute the present volume. He is bright and breezy and yet most informative. His banter is always good-natured. Unfortunately for medical readers, the technical aspects of the problems he was sent to study are here omitted, and we are merely treated to the spectacle of a grey-haired school-boy having a jolly good holiday; and we only wish that he would personally conduct us over this or any other foreign tour.

The Sthenics. By Sir James K. Fowler, K.C.V.O., C.M.G., M.D. Pp. 81. London: Macmillan & Co. Ltd. 1930. 3s. 6d.—The tides of practice retired, Sir James K. Fowler ruminates on man in life's fitful fever; delineates a type, and assigns its physiology. "Sthenics" is not the echo of "neurasthenics." The sthenics are men of "sthenical affections" (as Kant has it), and have the marks of vitality, exuberance, and versatility, are keen of sense to a fault, and egotistical. Curious instances of hypersensitiveness are given, and a gastric crisis described, of adrenal origin, the infirmity, it is argued, mistaken in Napoleon for epilepsy. A lay public loves the anatomy of genius and the play of a hidden secretion upon career and character. Sir James Fowler's book is too brief for so full a fancy; he has admired the scientific vision of Dr. Budd of Bristol (by the way Dr. Budd is described as "attached to the General Hospital"; actually he was Physician to the Royal Infirmary 1847–62), felt in the fields of France the spell of Jeanne d'Arc, and seen the reins of power in the hands of Curzon and Haldane.

Applied Physiology. By SAMSON WRIGHT, M.D., M.R.C.P. Third edition. Pp. xxviii., 552. Illustrated. London: Oxford University Press. 1929. Price 18s.—The appearance of a fresh edition of this work twelve months after the last is sufficient testimony to its popularity. In this, the third edition, the whole has been revised, much additional material being added and some of the sections considerably altered. A very valuable appendix on the conditioned reflexes has been included; this is an able synopsis of Pavlov's monumental work. The inclusion of such wealth of material has resulted in some of the sections, more particularly perhaps those dealing with the nervous system and with the body chemistry, being so elaborate and detailed that it is impossible not to feel that the book now rather tends to defeat its own ends. Controversial and minor points, which at the moment, at any rate, can only have an academic interest, are presented in such detail that the work has become rather a valuable book of reference for the pure physiologist than a concise statement of the essential facts of physiology as they concern the clinician. Some of the tables copied from other authors appear to have suffered in the transfer. For example, the table describing the chemistry of physiological and pathological cerebro-spinal fluids, which is said to be after Symonds, shows small but very important variations from the tables published by C. P. Symonds in the *Clinical Journal*.

Le Sinus Carotidien et les autres zones Vasosensibles Réflexogènes. By Dr. CORNEILLE HEYMANS. Pp. 121. Illustrated. London: H. K. Lewis & Co. Ltd. 1929. Price 5s.—In this interesting monograph is described a series of ingenious experiments proving that the variations in heart rate and systemic blood pressure, which follow alterations in the cephalic blood pressure, are due, not to direct stimulation of the cardiac and vasomotor centres, but to a reflex, the receptor organ of which is the carotid sinus and carotid body. The experiments would appear to prove this thesis conclusively. However, the author invokes the suprarenals as playing a part in the vasomotor mechanism of this reflex, and holds the view that a continual secretion of adrenalin is responsible, in part at all events, for the maintenance of normal vasomotor tone. This is not in accord with the current English views, and his conclusions on this point cannot be accepted too freely. There is a full bibliography of the anatomy and physiology of the carotid sinus and carotid body. These

researches should be of great interest not only to physiologists but also to pathologists and clinicians; but before the thesis can be accepted as proved the work obviously requires confirmation from other workers.

Introduction to the study of the Nervous System. By E. E. HEWER, D.Sc., and G. M. SANDES, M.B., B.S. Pp. xii., 104. 53 illustrations. London: Wm. Heinemann Ltd. 1929. Price 21s. Not only all the innate reflexes of man, but also those which have been termed "conditional," for which the integrity of the cerebral hemispheres is essential, are necessarily dependent upon a definite architecture of the nervous system. In this volume the text and diagrams are the outcome of long teaching experience. Although there is a distinct danger that the student may store such diagrams in his mind to the exclusion of the actual arrangement of the systems as these exist in the body, it is still true that only by diagrams can such complicated connections as those of the cerebellum for example be made clear. A careful search has failed to reveal misstatements in the text or errors in the figures, praise that few text-books deserve. The authors have succeeded in producing a really valuable book and one that can be recommended with confidence to students, teachers, and practitioners alike.

Acute Infectious Diseases. By J. D. ROLLESTON, M.D., M.R.C.P. Second Edition. Pp. xi., 419. London: Wm. Heinemann Ltd. 1929. Price 15s.—The first edition of this work appeared in 1925, and was based on twenty-five years' experience as a medical officer under the M.A.B. This year Dr. Rolleston has brought out a second edition, and has embodied all the recent advances made during the last four and a half years. He writes critically and informatively on both the Schick and Dick re-actions in the diagnosis of diphtheria and scarlet fever respectively. From his own experience of the two tests he regards the Schick test as far the more reliable. He does not consider the practitioner is under the same obligation to recommend active immunisation against diphtheria as he is to urge vaccination against small pox. Attention is drawn in the chapter on vaccination to the reported cases of nervous sequels which have followed vaccination, more especially in this country and Holland. Attention is also called to the recommendations of the Committee, appointed by the Ministry of Health, with the

hope of lessening these disasters. Every chapter of the book is well written and full of well-digested knowledge, which is invaluable to every practitioner in carrying out his daily task.

Testicular Grafting from Ape to Man. By SERGE VORONOFF. Pp. viii., 125. Illustrated. London: Brentano. 1929.—This small book gives a full account of the author's method of rejuvenating old men by grafting ape's testicle on to the surface of the human tunica vaginalis. The histological evidence is given that such grafts survive, at any rate for about four years. The ingrafted testis is cut into four, like splitting up the sections of an orange, and two pieces implanted on the rawed surface of each tunica vaginalis. Only a minute or two should elapse between dividing the vascular attachments of the animal gland and sewing it on to the human. It is claimed that as a result of 475 cases treated since 1920, success was usually attained lasting about five years; a brief psychical improvement during the first few days not being counted. The results are given as follows: 236 cases of premature senility, 10 per cent. failed, 90 per cent. success; 64 cases of senility, 26 per cent. failed, 74 per cent. success; 28 cases of impotence, 11 per cent. failed, 89 per cent. success; 14 cases of impotence due to organic causes, 43 per cent. failed, 57 per cent. success. Opportunities are scarce in this country to obtain suitable material for the graft, as the ape must be neither too young nor too old; we think, however, that we must allow that the writer makes out a sufficiently good case to warrant a trial of his method when it is possible.

Hæmodynamics. By P. B. KITTEL, F.R.C.S. Pp. xi., 195. Illustrated. London: H. K. Lewis & Co. Ltd. 1929. Price 10s.—The above title covers the physiology and treatment of varicose veins. After describing the three types of varicosity, the author discusses the action of the valves. He holds that incompetence of the valves results from, and is not the cause of, dilated veins. He states that if œdema, following venous thrombosis, persists for a year, it will probably be permanent. He believes that varicose ulcers arise from the hydrostatic effect of the œdema upon the nerves, the lesion being extended later by secondary infection. His chapters on treatment are based on 446 cases covering 2,731 injections into the veins. No tourniquet is used. The skin is painted with iodine. The patient is recumbent for treating large veins, sits down for smaller veins, and stands

for the smallest ones. Injections are started at the calf level, avoiding vessels over the tibia. The quantity of solution used depends on the drug. The patient then lies down for a minute and a light bandage with wool pad may be applied. With regard to the drug, the author has tried many. He discarded salicylic acid and quinine as they were liable to be painful and sometimes produced ulcers. Borocaine and glucose were found to be ineffectual but harmless. He then turned to sodium morrhuate in 5 and 10 per cent. watery solutions. With this he finds the veins become blocked and hardened in a few minutes, and ulcers do not follow. About eight injections are usually required. This book differs from the extensive literature which has appeared on this subject by the detailed discussion on the mechanism of venous, capillary and lymphatic flow and its relation to œdema.

Varicose Veins. By T. H. TREVES-BARBER, M.A. Pp. 120. 11 illustrations. Bristol: John Wright & Sons Ltd. 1929. Price 6s.—Dr. Barber in this little book, based chiefly on personal observation and practice, sets out to describe to the uninitiated the injection treatment of varicose veins. We feel that those who follow carefully his teaching and take heed of his warnings should have no difficulty in putting this method of treatment into practice. As the author states, there is as yet no ideal sclerosing solution. He advocates from personal experience a hypertonic saline solution in preference to the more generally used quinine and urethrane solution and apparently has found no cause to regret his choice. We can recommend this book to the general practitioner.

Orthopedic Surgery. By Sir ROBERT JONES, Bart., K.B.E., C.B., Ch.M., F.R.C.S., and R. W. LOVETT, M.D., F.A.C.S. Second edition. Pp. 807. 792 illustrations. London: Oxford University Press. 1929. Price 52s. 6d.—This standard book, representing the mature views of the two greatest authorities of orthopedic surgery in England and America, was first published five years ago, and represents one of the happy results of that close co-operation between the chief countries of the English-speaking world which took place during the war. It was based upon the wider definition of orthopedic surgery agreed to at that time, and dealt therefore not merely with deformities, but with surgery of bones and joints, muscles and nerves. The present edition

has lost, by death, the guiding hand of the distinguished American author, whose place has been taken by two well-known orthopedists from Harvard University, whilst the younger generation in this country has been represented by Mr. Harry Platt of Manchester. The following represent the chief additions to the new edition. In Chapter v, on stiffness and ankylosis of the joints, a Putti's operation for arthroplasty of the knee is described and illustrated, but to this description is added a word of warning as to dangers and limitations. In Chapter xi the operative treatment of arthritis deformans is given a greater prominence, special reconstructive operations on the hip being described. In Chapter xvi the developmental diseases of bones is more fully dealt with, and it is to be remarked that rickets is included in this heading. In Chapter xvii on affections of adult bones, the recent work of the American collective investigation of bone sarcoma is included. In Chapter xxi on poliomyelitis, additions, chiefly descriptive of operations for the substitution of paralysed muscles, have been made. We note with some surprise that the operation for substituting tensor fasciae femoris for the paralysed glutei described by Hey Groves in his Bradshaw Lecture of 1926 is attributed to Ober, whose article appeared in April, 1927. In Chapter xxxii on scoliosis, many of the modern methods of forcible correction of the deformity, including that of Galeazzi, are described, but these are accompanied by a wise warning as to length of time needed for exercises and after-treatment in order to make such methods worth considering. The many clear illustrations greatly add to the value of the book, and of these some of the best are those X-ray pictures provided by Mr. Thurstan Holland. The great and outstanding value of the work is that it gives the considered judgment of two of the wisest orthopedic surgeons. That this judgment, if it ever errs, does so in the direction of conservatism is perhaps an advantage. The defect of the book is that it does not give a sufficiently full account of modern operative methods, *e.g.* those of bone grafting, or those used for ununited or malunited fractures.

Recent Work on Colporrhaphy, Rheumatism and Coli Bacilluria. By E. H. ROBERTS, F.R.C.S. Pp. 28. Illustrated. London: H. K. Lewis & Co. Ltd. 1929. Price 3s.—This is an interesting monograph divided into four parts. Part I. is a description of the author's technique for the operations

of anterior and posterior colporrhaphy; it is clear and well illustrated, although possibly overshadowed by Ward's recent work in Kelly's *Gynæcology*. Part II. is a follow-up of fifty-two cases, showing good results, and also introducing the relation of rheumatism to cystocele. In Parts III. and IV. the author elaborates this relationship, dwelling on the causal possibilities of coli bacilluria in rheumatism, but rather surprisingly seems to suggest that a cystocele is an effect and not a cause of chronic rheumatism.

The Hygiene of Marriage. By I. E. HUTTON, M.D. Second Edition. Pp. x., 125. London: William Heinemann Ltd. 1929. Price 5s.—This small book sets out to put before men and women about to be, or already married, the facts of sex life, not in the prurient language of a certain author, but in normal medical and lay terms, and this it accomplishes admirably. Sex matters are "dealt with during all phases of married life," combined with easily understandable physiology and anatomy. In this, the second edition, fresh chapters have been added, including one on menstruation and the menopause. This chapter is especially necessary, and has added greatly to the value of the book. It can be recommended, without fear, to any woman seeking advice in matters of sex or personal hygiene.

Burdett's Hospitals and Charities. Pp. xxviii., 1,015. London: Nursing Mirror Ltd. 1930. Price 21s.—This invaluable reference work has reached its fortieth annual issue, and as time goes on its usefulness increases. It is known all the world over as the most reliable guide to all our hospitals, dispensaries and benevolent institutions. But the column for 1930 contains a review of current topics and problems connected with voluntary hospitals contributed by Captain J. E. Stone, which is of particular interest. The Local Government Act of 1929 aims at placing a complete hospital service within reach of everybody by means of an agreed policy between the voluntary hospitals and the local authorities. Captain Stone's article deals with this subject in an exhaustive manner, and contains besides useful details as to the various plans adopted by the hospitals in such questions as paying beds, contributory schemes, radium and cancer treatment. All who take any interest in the changes in hospital affairs which appear imminent will find Burdett's *Hospitals and Charities* the book of the hour.

Editorial Notes

Granuloma Laryngis; a Collective Investigation.

Mr. E. Watson-Williams has been invited to collate cases of (? papillary) granuloma of the larynx, or of a similar nature, with special reference to occurrence after exposure to mustard or other irritant gas, for presentation at the Summer Meeting of the Laryngological Section of the Royal Society of Medicine. The points of note appear to be:—

1. Signs and symptoms, clinical appearances.
2. Date of exposure to gas, nature of latter.
3. Latent period, if any.
4. Operative measures; exact site of granuloma; *pathological report.*
5. Exclusion of syphilis, tubercle: blood or sputum examination?
6. Subsequent history.

If any of our readers have met with cases of this hitherto little-recorded condition, Mr. Watson-Williams will be grateful to have reports forwarded to him at the Bristol Royal Infirmary. Illustrations, microscopic slides, and of course, when possible, personal presentation of cases or reports will be especially welcome. References to published cases or to occurrence apart from war service will be valued.

Harvey Memorial Fund.

AN appeal has been issued to the medical profession by an influential Committee whose Chairman is Sir John Rose Bradford, for funds to restore the tower of Hempstead Church in Essex, which collapsed in 1882. Here lie the remains of William Harvey, whose family was long associated with the church, a fourteenth-century building of considerable interest. The estimated cost of this restoration is £5,700, of which about £1,000 has been subscribed. It is hoped that a Bristol Committee may be formed for the collection of funds. We feel sure that the medical profession in the West of England will be glad of this opportunity to do honour to the memory of William Harvey, who did so much to establish the study of medicine on a basis of truthful and accurate observation.

* * * * *

The Hunterian Oration, 1930 (76th).

IF Harvey's achievements were on the grand scale, so also were John Hunter's, and Professor Hey Groves was well advised to entitle the 76th Hunterian Oration, which he delivered at the Royal College of Surgeons on February 14th, "Hero Worship in Surgery." He justified this title by reference both to Hunter's character and also to his achievements; dwelling in particular on his experiments in grafting. Professor Hey Groves is to be congratulated no less on the matter and the manner of his Oration than on the honour done to him by his election as Orator—the third time that this honour has fallen to a provincial

surgeon, the others being George Murray Humphry of Cambridge and the present President of the Royal College of Surgeons, Lord Moynihan.

At the Hunterian Festival Dinner held the same evening at the College the Vice-Chancellor of the University of Bristol, Dr. Loveday, proposed the Orator's health, and expressed the pleasure that this recognition of Professor Hey Groves's great contributions to the advancement of surgery had given to his colleagues in Bristol.

Meetings of Societies.

Bristol Medico-Chirurgical Society.

The second meeting of the session was held at the University on Wednesday, 13th November, 1929, the President in the chair.

MR. E. WATSON-WILLIAMS read a paper on **"Cancer of the Tonsil."** *Sarcoma* accounted for about 20 per cent. of cases. Two out of three patients were males, and the disease might occur at any period of life, even in infancy, though most frequent in middle age. Spindle-cell, round cell, mixed, myxo- and melanotic sarcoma and endothelioma are described. Clinically the two groups of fibrosarcoma and lymphosarcoma are recognized. Attempts at classification by tissues of origin have been made: as, fibrosarcoma arising from vascular and connective tissue, reticulosarcoma arising from gland reticulum and true lymphosarcoma or lymphocytoma malignum from the lymph cells of the tonsil itself. Such a classification is premature; the different types merge one into another even in the course of a single case, and a purely clinical classification is probably as useful as any.

Fibrosarcoma is a condition of local malignancy, involving surrounding structures, but not producing glandular metastases.

The first complaint is of a lump in the throat or of consequent difficulty in speaking or swallowing. One tonsil is found to be enlarged or to be replaced by a large red or purple mass in the faucial pillar. Ulceration is at first absent. Extension occurs into the deep tissues of the neck, and an external swelling appears behind and fixed to the ascending ramus of the jaw. In the later stage ulceration and sloughing occur, and distant metastases are found in liver, etc.

Lymphosarcoma resembles the above in general features, but there is early involvement of the cervical glands: this is said to be by lymphatic permeation and not by embolic metastasis, and affects both sides of the neck even from one tonsil. Extension later occurs to other glands, especially in the mediastinum. These glands are hard and fixed, and tend to coalesce and to ulcerate.

Lymphocytoma malignum represents the most malignant variety. The condition is described by Kundrat as affecting healthy middle-aged males, and starting either in a group of glands or in the lymph tissue of the alimentary canal. The tonsil provides one of the most important groups of this condition. Both tonsils may be involved simultaneously or in swift succession; glandular affection is early and extensive. The glands remain firm, discrete and mobile, and many groups of glands all over the body may show changes; blood changes are common. Kundrat considered tuberculosis played no part in the condition, but others have held the contrary view.

Diagnosis rests on the clinical appearances, and is confirmed by histological examination. In many of the reported cases an incision has been made in search of pus; the absence of œdema, pain and fever should prevent this mistake. Treatment is unsatisfactory. Where there is no involvement of glands operative removal may be successful (? 10 per cent.), and an operation through the mouth offers as good a prospect as lateral pharyngotomy with removal of glands and division of mandible. These growths are very susceptible to radium and X-rays, but in only too many cases the condition recurs and proves intractable.

[The speaker then described three cases of sarcoma of the tonsil under his care.]

Carcinoma of the tonsil is a disease of later life, rare before 45; seven out of eight patients are males. Rare examples

of basal-cell and of adeno-carcinoma have been seen, but the common type is squamous epithelioma. Clinically two types may be recognized, the acute and the slow. In the former there is complaint of pain on swallowing, pain in the ear, or sore throat worse at night, with salivation, fetor of breath and rapid wasting. Within five or six weeks of the onset ulceration, obviously malignant, has involved a large part of the fauces, and may already have spread to the opposite side, out on to the cheek, into the base of the tongue, or the posterior pharyngeal wall. In the very acute cases the patient might be obviously dying before glandular involvement was apparent. The slow type was in its later phases prone to transition to the rapid, and one might consider here those cases which came with a history of many months of trouble, and with similar very extensive ulceration, but as a rule with very greatly enlarged cervical glands in addition. Of the speaker's cases four belonged to the former and five to the latter class. Treatment is almost impossible here, although if not too advanced radium produces a temporary alleviation. In three cases selenium injection was followed by a few weeks' remission of symptoms. Orthoform is generally advised, but as a rule opium is the only effective anodyne.

In the slower type the earliest symptoms are: (1) Pain in the ear, often worse at night; *or* (2) pain in the throat, worse on swallowing, or the sensation of a lump, with a constant desire to swallow; *or* (3) enlarged glands in the neck.

In the early stage a hard nodular growth is seen or felt on the tonsil or just at the edge. It soon ulcerates, and then presents the hard everted edge so characteristic of malignancy. As has just been said, the cervical glands are early involved.

Cases cited exemplify each of these modes of onset, and the extreme importance of early recognition. The most frequent mistake is to waste valuable time on dental treatment; gross dental sepsis is very commonly associated with malignant disease of the pharynx and œsophagus, but does not produce painless, hard, fixed cervical adenitis. Laboratory tests should not be relied on to exclude carcinoma: a syphilitic scar can become the site of malignant disease, as in a case cited; many malignant ulcers would yield Vincent's spirillum. But a gummatous ulcer was seldom very painful, and would be healing rapidly at the end of a week on intensive iodide medication, just as Vincent's angina yielded to arsenic. In every case where there was any doubt at all a biopsy should be at

once performed, and would generally settle the diagnosis, except that where all treatment is declined it is better to avoid even a biopsy.

[The speaker then related case histories illustrating the mistakes that could be avoided.]

Operation should be attempted whenever possible. Suitable cases are those in which the primary growth was confined to the tonsil, or at least did not invade the tongue, and in which the glands were not so fixed that the internal carotid was probably involved. Lateral pharyngotomy is a severe operation and probably unnecessary. The operation of choice is carried out in two stages: (1) Block dissection of the neck glands, etc. (with ligature of the external carotid): (2) diathermy dissection of the affected tonsil and surroundings. Radiation therapy is possibly advisable after the operation.

In cases unsuitable for operation the implantation of radium needles around the growth has met with a fair measure of success; in these, however, the problem of the neck glands is always difficult. The gland part of the operation is the serious stage, and radiation of glands has not met with a large measure of success. In conjunction with other methods, or even alone, injections of colloidal selenium are of the greatest value.

[The speaker then described the five cases shown before the meeting, three treated by operation, one by selenium and radium, and one by selenium alone—all apparently "cured," though one is very recent. He referred to palliative operations and their results at his hands. He mentioned a number of cases in which recurrence had taken place, to emphasize the frequency with which the tongue was invaded. Finally, he uttered a plea for early recognition of these cases as the necessary precursor of effective treatment. Epidiascopic illustrations of early appearances were given.]

DISCUSSION.

The PRESIDENT asked whether Mr. Watson-Williams had been troubled by secondary hemorrhage after diathermy, and whether he found that much shock resulted from a block dissection, and referred to cases where very large glands had been present at a time when the primary growth was of insignificant size.

MR. A. J. WRIGHT was glad the speaker had emphasized the importance of not assigning dental sepsis as a cause of

enlarged cervical glands. He asked whether he had seen a case in which growth began in a tonsillar crypt out of sight.

MR. W. A. JACKMAN gave details of one of the cases shown, the man treated with selenium only, and said he was very glad so good a result had been obtained.

DR. P. WATSON-WILLIAMS emphasized the need of early diagnosis in these cases, and said that he felt treatment with selenium had not been everywhere given an adequate trial.

DR. SUTHERLAND inquired whether a swab report would not serve more rapidly than medication to establish a diagnosis of Vincent's angina.

[Answer.—Quite, but a positive report does not *exclude* carcinoma.]

The third meeting of the session was held on 11th December, 1929, when MR. A. RENDLE SHORT made a report on **"Some Experiences with Radium in the Treatment of Cancer."** He pointed out that the great improvement which has taken place in the results is due to the alteration of technique, in the direction of using small doses for a week, instead of large doses for a day. This report must be regarded as very tentative, because our experience is so recent, and the quantity of radium at present available at public institutions and in private hands in the town is far too small for the needs of the district.

He presented a report on twenty-one cases, which included all treated, except a few in which radium was used merely as an adjunct to surgery. Of the twenty cases, four were considered operable, seventeen inoperable. The results were as follows: Two died; four little, or no better; three resulted in disappearance of growth locally, but now suffer from metastases; six gave good results, and are alive and free from recurrence; six others were improved, but results must be classed as doubtful. (Since the report one of these has definitely recurred, and another seems to be clinically cancer free.)

The regional distribution of cases was as follows: Prostate two, both improved; rectum five, one did well; breast four, all did well; mouth and tongue six, five improved, but three recurred.

The fourth meeting of the session was held on 8th January, 1930. DR. A. T. TODD read a paper on "**Dyspepsia.**" The current theories of pain production were reviewed. It was pointed out that dyspeptics could be divided into two classes, *i.e.* those complaining of pain and those who had no pain. It was shown that the dyspeptics who complained of pain had hyperalgesia of certain muscles of respiration and that pressure on these muscles reproduced the pain felt after food. It was shown that there was also respiratory disability and that shortness of breath was not infrequent.

The dyspeptics who did not complain of pain did not show this hyperalgesia and were not short of breath.

The importance of the respiratory pump action on the circulation was discussed; failure of this action intensified the shortness of breath produced by the respiratory disability.

It was shown that all graduations from this simple pain, through the effort syndrome to fully-fledged angina pectoris were to be found in painful dyspepsia. That adequate treatment of this group of anginal cases was followed by disappearance of the symptom.

It was concluded that gastric pain was the result of a reflex spasm of certain respiratory muscles. That shortness of breath was frequently produced and then the condition was wrongly diagnosed as cardiac. That the pain might be that of angina pectoris and a possible result of continued muscular irritation causing arterial degeneration was demonstrated.

The fifth meeting of the session was held at the University on Wednesday, 12th February, 1930, the President in the chair. PROFESSOR D. P. D. WILKIE gave an address on "**Acute Intestinal Obstruction,**" which will appear in our next issue.

The Medical Library of the University of Bristol,

WITH WHICH IS INCORPORATED

The Library of the Bristol Medico-Chirurgical Society.

The following donations have been received since the publication of the List in December, 1929.

	March, 1930.
The Governor, Gold Coast Colony (1) ..	1 report.
Far Eastern Association of Tropical Medicine (2)	2 volumes.
Michell Clarke Memorial Fund (3)	41 ,,
Munro Smith Memorial Fund (4)	9 ,,
Rockefeller Foundation (5)	2 ,,
International Congress of Tropical Medicine (6)	2 ,,

Unbound periodicals have also been received from Dr. Carey F. Coombs, Mr. Lacy Firth and Professor E. W. Hey Groves.

THE ONE HUNDRED AND THIRTY-FIRST LIST OF BOOKS.

The figures in round brackets refer to the figures after the names of the donors. The books to which no such figures are attached have either been bought from the Library Fund or received through the *Journal*.

Abel, A. L. .. .. *Oesophageal Obstruction* 1929
Bainbridge and Menzies. *Essentials of Physiology* .. .. .. 6th Ed. (3) 1929
Berkeley, C. .. .. *Handbook of Midwifery* .. .. .. 7th Ed. (3) 1929
Berry, R. J. A. .. *Through the States with a Seeing Eye* 1930
Bigger, J. W. .. .. *Handbook of Bacteriology* .. .. 2nd Ed. (3) 1929
Boyd, W. .. .. .. *Surgical Pathology* .. .. 2nd Ed. (3) 1929
Brain, W. R., and Strauss, E. B. *Recent advances in Neurology* .. (4) 1929
Brock, A. J. .. .. *Greek Medicine* .. .. (3) 1929
Burrell, A. S. T. .. *Recent advances in Pulmonary Tuberculosis* .. (3) 1929
Cameron, H. C. .. *The Nervous Child* 1929

Chauvin, E. .. .. *Maladies des Vésicules Séminales* 1930
Clark, W. M. .. .. *Determination of Hydrogen ions* .. 3rd Ed. (3) 1928
Conybeare, J. J. .. .. *Textbook of Medicine* .. .. (3) 1929
Crofton, W. M. .. *Outline of Endocrinology* .. .. 2nd Ed. (3) 1929
Curschmann, H. .. *Endocrine Disorders* 1929
Dew, H. R. .. .. *Hydatid Disease* .. .. (3) 1928
Dible, J. H. .. .. *Recent Advances in Bacteriology* .. .. .. (4) 1929
Dixon, W. E. .. .. *Manual of Pharmacology* .. .. 7th Ed. (3) 1929
East, C. F. T. and Bain, G. W. C. *Recent advances in Cardiology* (3) 1929
Forsdike, S. .. .. *Sterility in Women* .. .. (3) 1928
Garrison, F. H. .. *History of Medicine* .. .. .. 4th Ed. (4) 1929
Gillespie, R. D. .. *Hypochondria* 1929
Green .. .. *Manual of Pathology* .. .. 14th Ed. (4) 1928
Halliburton and MacDowall. *Handbook of Physiology* 18th Ed. (3) 1928
Hare, H. A. .. .. *Use of Symptoms in the Diagnosis of Disease.* 9th Ed. (3) 1928
Heberden .. .. .. *Introduction to the Study of Physic* .. .. (3) 1929
Herrick, C. J. .. .. *Introduction to Neurology* .. .. 4th Ed. (3) 1928
Hewer, E. E., and Sandes, G. M. *Introduction to the Study of the nervous System* 1929
Heymans, C. .. .. *Le Sinus Carotidien* 1929
Hotwell .. .. .. *A Poem* .. ..
Humphris, F. H. .. *Artificial Sunlight and its Therapeutic uses.* 5th Ed. 1929
Hurst, A. F., and Stewart, M. J. *Gastric and Duodenal Ulcer* .. (3) 1929
Jones, Sir R. and Lovett, R. W. *Orthopaedic Surgery* .. .. 2nd Ed. 1929
Jorden, E. .. .. .. *Discourse of Naturall Bathes and Mineral Waters* 1673
Joslin, E. P. .. .. *Treatment of Diabetes Mellitus.* .. 4th Ed. (3) 1928
Joly, J. S. .. .. .. *Stone and Calculus Disease* .. .. (3) 1929
Labat, G. .. .. .. *Regional Anæsthesia* .. .. .. 2nd Ed. (3) 1928
Lockhart-Mummery, P. *After treatment of Operations* .. 5th Ed. (3) 1929
Maclean, H. .. .. *Modern Views on Digestion and Gastric Disease* 2nd Ed. (3) 1928
Maclean, H. .. .. *Modern Methods in the Diagnosis of Glycosuria and Diabetes* .. .. 4th Ed. (3) 1927
Marshall, A. M. .. *The Frog* .. .. 12th Ed. (4) 1928
May, C. H. and Worth C. *Manual of Diseases of the Eye* 5th Ed. (3) 1927
Mead, S. V. .. .. *Diseases of the Mouth* .. .. .. 3rd Ed. (3) 1928
Muir, R. .. .. .. *Textbook of Pathology* .. .. .. 2nd Ed. (4) 1929
Myers, C. S. .. .. *Industrial Psychology* .. .. (4) 1929
Nouveau Traité de médecine Vol. XVII. 1929
Parfitt, J. B. .. .. *Operative Dental Surgery* .. .. 2nd Ed. (3) 1923
Paterson, D., and Smith, J. F. *Feeding in Infancy and Childhood.* 2nd Ed. (3) 1929
Pavlov, I. V. .. .. *Lectures on Conditioned reflexes* .. .. .. (4) 1929
Pearson, W. J. and Wylie, W. G. *Recent Advances in Diseases of Children* .. .. (3) 1928
Price, F. W. .. .. *Textbook of the Practice of Medicine* .. 3rd Ed. 1929

Pryde, J. .. .. .. *Recent Advances in Bio-chemistry* 2nd Ed. (3) 1928
Radium Treatment of Cancer of the Uterus .. .. 2nd Ed. 1929
Ramsay, E. M. .. *The Eye in General Medicine* .. 2nd Ed. (3) 1929
Rolleston, Sir H. and McNee, J. W. *Diseases of the Liver, &c.* 3rd Ed. (3) 1928
Rolleston, J. D. *Acute Infectious Diseases* .. .. .. 2nd Ed. 1929
Ross, J. S., and Fairlie, H. P. *Handbook of Anæsthesia* .. 3rd Ed. (3) 1929
Shaw, T. B. .. .. *Naval Hygiene* 1929
Stander, H. G. .. .. *Toxemias of Pregnancy* .. .. (3) 1929
Starling .. .. .. *Principles of Human Physiology* .. 5th Ed. (4) 1930
Stitt, E. R. .. .. *Diagnosis and Treatment of Tropical Diseases.* 5th Ed. (3) 1929
Sutherland, A. .. .. *The Nature and Qualities of Bristol Water* .. 1758
Thursfield, H., and Paterson, D. *Diseases of Children* .. 2nd Ed. (3) 1929
Tredgold, A. F. .. *Mental Deficiency* .. .. 2nd Ed. (3) 1929
Treves-Barber, T. H. *Treatment of Varicose Veins* 1929
Voronoff, S. .. .. *Testicular Grafting from Ape to Man* .. .. N.D.
Wheeler, Sir W. J. de. C. *Handbook of Operative Surgery* 4th Ed. (3) 1925
Willich .. .. .. *The Hotwell Water, Bristol* 1798
Worth, C. .. .. .. *Squint* .. .. 6th Ed. (3) 1929
Wright, S. .. .. .. *Applied Physiology* .. .. 3rd Ed. 1929
Yeomans, F. C. .. *Proctology* .. .. (3) 1929

TRANSACTIONS, REPORTS, JOURNALS, ETC.

Annales de l'Institut Pasteur. Table Générale. Vols. I.–XL. (1887-1927) 1929
Annual Report of the Rockefeller Foundation, 1928 .. .. (5) 1929
Annual Report of the Smithsonian Institution, 1928 1929
British Journal of Urology. Vol. I. and in continuation .. .. (3) 1929
Burdett's Hospitals and Charities, 1930 1930
Congres International de Médecine Tropical, etc. Tomes I. and II., 1928 (6) 1929
Far Eastern Association of Tropical Medicine. 7th Congress. Vol. 3 .. (2) 1927
Medical Directory, 1930 1930
Methods and Problems of Medical Education. 15th Series .. .. (5) 1929
Progressive Medicine, December, 1929 1929
Reports of St. Thomas's Hospital. Vol. 51 1927
Registrar-General's Decennial Supplement, 1921 1927
Surgical Clinics of North America, December, 1929 and February, 1930 1929-30
Transactions of the Association of American Physicians. Vol. 44 .. 1929
Transactions of the Ophthalmological Society. Vol. 46 1929
Westminster Hospital Reports. Vol. 20 1929

Local Medical Notes

EXAMINATION RESULTS.

University of Bristol. Students of the University have recently passed the following examinations :—

M.D.—W. A. Gornall.

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